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Windows.

OUR earliest forefathers got on without windows, and only went indoors to sleep or to protect themselves from storm or danger, so that their indoor occupations must have been very limited. We have better use to make of our time, most of which is spent indoors, and the admission of light and air into our buildings has been a chief consideration amongst all civilised nations.

The word "window" is used a few times in the Bible, but there is not much indication of their form, except such as we may gather from the description of Jezebel looking out of one, proving that the sill must have been near enough to the floor for that purpose, and the opening large enough for Jezebel to be thrown outof. The ancient Egyptians seem to have used wall windows, as may be seen in the Pavilion, Medinet Abou, and in a wall painting, both illustrated in Fergusson's "Hand-book of Architecture," pp. 247-248. There is also a most interesting model of an Egyptian house in one of the glass cases at the British Museum. This model contains a range of first-floor windows, divided up by mullion and transome; while the second-floor windows (?) contain an indication of something that looks uncommonly like diagonal quarry glazing. The palace of Darius at Persepolis, B.C. 521, contains a range of rectangular windows; but in the neighbouring country of Assyria there do not appear to have been such windows. Indeed, in Egypt, Persia, and Assyria, the admission of light and air into the temples and palaces seems to have been usually obtained through the interstices between the columns or piers of a raised superstructure. As to Grecian temples, the absence of any actual remains of windows,—except in the Erechtheum, the great temple at Agrigentum, and that at Eleusis,—has provided food for endless discussion as to the means of lighting their interiors. The Romans used arched windows in their public buildings, but do not seem to have cared much for them in their houses, being satisfied with the doors looking into the atrium and peristyle; the dining-room, however, or triclinium, was sometimes provided with a large window. The Saracens used windows certainly, but only to admit a subdued light through trellised openings.

Thus the constant and regular provision of windows in ordinary buildings for everyday purposes, and with the special object of providing abundance of light, seems to belong to a comparatively modern period of architecture.

It is observed by Viollet-le-Duc in his article on windows (Dic. Raisonné, vol. v.), that the daylight introduced through an opening into a building is pyramidal or conical in form, diminishing inwards. This is so contrary to the divergent appearance of the light that it is difficult to believe the statement. The proof of it lies in the fact that a small opening admits a shorter pencil of light than a large opening. This is easily proved by holding a sheet of paper farther and farther away from a small opening until the light fades away and ceases to illumine it. Then, by enlarging the opening, light will reappear on the paper. The distance travelled by the light, therefore, depends upon the area of the opening forming the base of a cone or pyramid.

This is a most important fact as abolishing the notion that two quite separate windows of, say, one square foot each will admit as much light as one window of two square feet. And it opens up great possibilities in the arrangement of light. Some light there must be in every part of a building, but equal light diffused over every part of it is "flat, stale, and unprofitable." Keep the greater part of an interior just sufficiently lighted for practical purposes, and cast a brilliant flood charged with the rays of the sun, on to the most important feature in the building, and there will be seen an effect worth living for.

To this calculation of effect Viollet-le-Duc attributes the huge rose-windows occupying the gable ends of Mediæval churches; their superior lighting power overruling the clear-story, and casting shadows without which all the moulding and carving in the world would be mere waste of labour. The interior of Polebrook Church, not far from Peterborough, is one that leaves an indelible impression on the mind, owing to a most artistic disposition of the windows.

It seems to have been a fate common to all styles of architecture, not excepting Greek, to become lighter and slenderer in construction as they went on; and partly from this cause, and partly from the fascination of crowding more and more stained glass into the wall surface, Gothic buildings became, as has been said of "proud Hardwick Hall, more window than wall." It is needless to repeat here that, so far as circumstances allowed, civil architecture went hand in hand with ecclesiastical, and that, so far only as requirements demanded, they differed, but no farther; it being reserved for the *imitative* architecture of recent times to adopt one style for churches and another for civil buildings.

The artistic effects of lighting must have suffered from this rage for glazing, though a redeeming opportunity was given by the various tones of the glass itself.

There is a danger just now of our using more stained glass than we really want. One of the most original and refined churches of modern times, Christ Church, Streatham, is, from this cause, dependent upon gas for its light, and the fashion for stained glass in our houses has deprived many a family of the wholesome view of the sky by substituting in the upper panes such glass as the speculative builder will get at the "lowest quotation." If we would only put stained glass where we want it,—and it is undoubtedly useful in many situations,—we should be better off, and the cost of the useless glass could be concentrated into the price of the right glass in the right place.

As an instance of misplaced light, a London church may be mentioned where a little apse and elaborate fittings have recently been added at a cost that would pay for two or three complete and handsome churches. Here every pennyworth of the pains taken by the designer is wasted by the glare of two brightly-coloured windows that strike the eye from every point of view, and cast the costly materials, the delicate carving, and the rich painting into chaotic shade. If these two windows were blocked up, and the next pair, which are almost out of sight, were filled with white glass, the money's worth would be seen.

Many people, even those of such a practical turn of mind as the eminent architect to the Ecclesiastical Commission, like clear quarry glazing in their own houses, and there is undoubtedly a great charm in the comfortable "indoor" feeling produced by the visible network of lead lines between us and the outer air. Great care is, of course, needed in properly cementing the quarries into stout lead-work. To go to the other extreme, and to use huge sheets of plate glass, simply because such can be purchased for money, seems to be illogical reasoning.

The advantages of plate glass are its strength and clearness: no one wants to see a distorted image through a window; but having secured these advantages, all other practical requirements are best fulfilled by dividing the window into panes with sash-bars. They materially strengthen the sashes, and the panes are more easily and cheaply replaced if broken. If kept at least 12 in. apart, they do not materially obstruct the view; at all events, the slight obstruction is more than compensated for by the sense of indoor comfort that they supply. Let any one who doubts this try the experiment of living in a room fitted with both kinds of window.

Bearing in mind Viollet-le-Duc's demonstra-

tion as to lighting power, it will be seen that the size of the windows of a room will be regulated by the dimension of length or width that subtends them, and that an end light must be made more powerful than a side light. This, of itself, will furnish a variety of window size or window spacing that will at once relieve a building from slavish (so-called) Classical monotony. While using windows enough, and being duly thankful that we do not live in the days of the window-tax, we have to avoid the danger of too much window-surface, especially in a moderate-sized living-room, otherwise the occupants will have no choice between "melting moments" right over the fire and freezing moments in other parts of the room. The right amount of light, in the right place, not forgetting a well-lighted wall or two for pictures, and the avoidance of a blinding glare in the eyes as one enters the room, are the items of a problem that has to be solved. There is a prevalent rage for "French" windows, leading into the garden, of which fashion one can easily have too much. The draught from such windows is sharper than from an ordinary window, and if any other way can be contrived to go from a smallish room into the outer air, by means of a side lobby, so much the better.

Many people like the complete opening that can be obtained by means of French and other casement windows; but the difficulty of using sunblinds if they open outwards, or of using inner blinds, shutters, or curtains, if they open inwards, seems to give the balance of advantages in favour of the more modern double-hung sash-window. Modern ingenuity has been devoted to rendering this form of window perfect, and the contrivance for raising the bottom sash so as to introduce an upward current of air between it and the upper sash, and yet without opening the window at the bottom, is surely an achievement. If this be done by means of a deep bottom rail to the lower sash, we may look for another of those many new features that are slowly accumulating towards the formation of a recognised style; and it may be added that there is more designing to be put into a sash window than is generally supposed.

The weak point in double-hung sashes consists in the danger of the sash-lines giving way, and in the amount of "cradling" which has to be made for these weights to work in, to the detriment of real solidity and honesty of construction. Any one who could invent a vertical sash-hanging without pulleys, and applicable to large and heavy window-sashes as well as small ones, would do the world a service.

The Swedish windows, described and illustrated by the Librarian of the Institute in a former number of the *Builder*, could also be used where double-hung sashes are undesirable. Their water-tightness appears to be marvellous, and their construction far cheaper than the more complicated arrangements made in England.

Much ingenuity has been displayed by architects in combining stone transoms or mullions, or both, with wooden casements or sashes, and many of us will remember the regret expressed by one of our leading practitioners at the adoption of eighteenth-century windows, "just as we were getting Gothic work into practicable shape" (or words to that effect). Except, however, in a very lofty room, there is really no need for stone transoms to strengthen the window-opening, and, while admitting the convenience of stone mullions for subdividing a fine large window, one cannot help being sensible of a certain grittiness in the presence of a stone surface in the midst of the joinery and upholstery of a truly modern house. In halls, passages, and other thoroughfares the discordance is not felt, as a rule, and the windows themselves, owing to their positions, often assume various odd shapes to the design of which stone mullions are welcome aids.

In all periods of architecture, before the imitative styles gained the predominance, windows, where seen in position, have formed unerring indications of the purpose of the buildings in which they occur, and, unless they have been inserted in older work, are an equally sure indication of date. Doorways, arcades, buttresses, walling are blank pages as compared with the information conveyed by windows in their successive developments from the eleventh to the sixteenth century, and even then the Early Renaissance architects preserved a manly independence, selecting and adapting just what ideas they wanted from the revival of Classic art, and thus creating a recognised style.

We have a still wider field for selection and are taking a longer time in casting aside that which, to us, is archæological dross; but when we have *consented* to a convenient, practical, and beautiful set of windows, appropriate to the respective buildings in which they occur, something very near to a recognised modern style will have been formed.

GREEK PLAYS IN LONDON.

THOUGH the term "Renaissance" is generally applied to the historical period of the fourteenth and fifteenth centuries, when classical learning and taste were revived in Italy, the term might, in a new sense, be applied to our own immediate time. For, whereas classical, more especially Hellenic, culture, was, in the fifteenth century in Italy, restored through the channels of Roman history, art, and literature, the new feature of the revival lies in the directness with which we go back to Greek culture itself, as well in the study of art as in history and literature. This tendency has led not only to the modification of the ordinary university studies, and to the introduction of branches of study (such as classical archæology) which were hitherto neglected, but it has extended its influence beyond the ordinary bounds of university work to a wide circle of lovers of Hellenic culture, who are endeavouring to reproduce what is best in the great past of Greece.

Of late, the efforts of these Hellenists have been chiefly directed toward the reproduction of the Greek drama. Oxford undergraduates led the way with the performance of the "Agamemnon"; Harvard University followed with the "Œdipus"; smaller attempts were made at various places, especially at Bradfield College, while at Cambridge the performance of the "Ajax" was followed by the production of the "Birds" and the "Eumenides," and the Greek play has become a regular institution, if not officially academical, at least a part of Cambridge life.

Two similar attempts in London within the last few days show that the metropolis is also moved by this spirit of Hellenic revival, and all who recognise the good that dwells in things Greek will hail such signs of awakening and will be grateful to the promoters of such laudable enterprise. There is always some fear lest good movements may not evoke reaction when once they become "fashionable": for this is often the price at which metropolitan publicity is bought. Yet the pure profit to be derived from such efforts will, we hope, remain, however numerous the imperfections in the work produced, and however strong the reaction which exaggeration and sham may call forth.

The first of these revivals in London was the performance of the Story of Orestes at Prince's Hall on Thursday, May 13th. Prof. Warr here endeavoured to condense the Orestean trilogy of Æschylus (Agamemnon, Choephoræ, and Eumenides) into one drama. As the three Greek tragedies are continuous and strongly bound together, it was an experiment well worth making to produce the whole in one performance. But the copious cutting which this necessitated interferes so much with the continuity of action that we believe the experiment has proved such attempts to be futile. On the other hand, we must draw attention to Prof. Warr's translation, which is masterly in the proximity with which it follows the Greek, and the freedom and beauty of the English.

The performance itself was, chiefly owing to the very cramped space given to actors and chorus, not as impressive as previous performances of Greek plays have proved to be. Considering these disadvantages the chorus (Argive and Athenian elders and maidens) performed its part very creditably. The drapery both of men and women was not always successful, sometimes even mediæval, and not Greek in character. Two attempts at "*archaising*" accurately were not successful. The first was the attempt to give masks to the Furies. The masks in the Greek drama had chiefly a *constructive* origin. The conditions of space in the Greek theatre, both with regard to sight and sound, called for the Greek masks and the *cothurnus*, the mask acting as a speaking-tube. In reproducing masks we should have also to reproduce the other conditions of the Greek stage, and the whole "make-up" of the Furies themselves, as well as of all the other actors, and the character of the accessories in the play would have to correspond. Unless complete accuracy is aimed at and a strictly and primarily archæological spirit pervades the whole performance, it is better to give up such attempts at archaising and to adapt the plays in the less essential features to the requirements of modern taste. The same holds good with regard to the music which was composed by Mr. Walter Parratt. We cannot reproduce Greek music, and even if we could the great development of that art in modern times has affected our very organs of hearing, and the consequent requirements of our taste. The effect which the more rudimentary music produced upon the ancient Greeks, and its importance as a feature in their dramatic performances, can only be adequately represented in a modern performance by a much more elaborate form of lyrical art. The chanting of the chorus in the Story of Orestes was not even effective by its simplicity. Greater simplicity might have been maintained in the acting, especially of Clytemnestra, who evidently admires some of the mannerisms of Sarah Bernhardt. On the other hand, Miss Dene's rendering of Cassandra was not only intelligent, but, in the weird and visionary pathos of her prophecy, caused many a student to realise, more fully than he could from the mere reading of the Greek, the solemn grandeur of Æschylos.

No doubt the most interesting and successful features of this performance were the tableaux. The first of these represented the "Sacrifice of Iphigeneia." It was designed by Mr. G. F. Watts, the background representing the coast of Aulis, painted by Mr. Arthur Severn. There was a famous picture in antiquity representing this scene, by Timanthes of Kythnos, of which Pliny, Cicero, and Quintilian give us an account. The picture is said to have been remarkable for the success with which the artist presented the rising scale of pathos; Kalchas was sad, Ulysses deeply grieved, Aias distressed, whilst the artist refrained from painting the face of the father, Menelaos, and thus represented him as covering his face with his cloak. In an extant mural painting from the Casa del Poeta Tragico at Pompei, as well as on a relief on a small drum in the Uffizi, at Florence, we no doubt have modified reproductions of the picture of Timanthes. Mr. Watts followed these to some extent in the general arrangement of figures, as well as in the action of Agamemnon, which Lessing praises as showing how well the Greek realised the limitations of his art. Iphigeneia, with head upraised, has sunk back before the altar, supported by the attendant of Kalchas, the priest, who raises the knife above the altar to deal the fatal blow. On the other side, Agamemnon covers his face with his cloak, and behind him a fury with a torch stands beside the altar as a presage of the fate which is to befall the house of the Atridæ, and which governs the whole of the trilogy. Greek warriors are grouped round these central figures.

The other tableaux, designed by Mr. Walter Crane, were Nemesis, or the Return of Agamemnon; the Dirge at the Tomb of Agamemnon; and Orestes before the Areopagus. Of these the Dirge before the Tomb of Agamemnon was the most successful. Electra, seated before the sepulchral stele of Agamemnon, with her attendants grouped about her and a background of cypress trees, was most im-

pressive. The smallness of the stage made the last tableau less impressive, especially to those who had seen the last act of the Eumenides at Cambridge.

The same painful feeling concerning the smallness of the stage and the imperfections of stage arrangements was certainly not experienced by those who witnessed the performance of Mr. Todhunter's play "Helena in Troas" at the Greek Theatre in Argyle-street on Monday last. It was certainly one of the most beautiful sights ever offered to the London public, and Mr. E. W. Godwin, who was responsible for the stage arrangements, may be heartily congratulated upon his successful accomplishment of a very arduous task. Upon entering the theatre, usually known as Hengler's Circus, it required no great stretch of the imagination to fancy oneself transported to ancient Greece, and this in spite of the modern audience and the galleries and boxes. For the eye was immediately attracted by the theatre proper, in which the bold attempt had been made to solve by demonstration the vexed question of the actual arrangement of the Greek stage. What was formerly the ring of the circus, was covered by boards and canvas representing the tessellated marble pavement of the orchestra, in the centre of which stood the thymele or altar of Dionysos. This orchestra or choros was one of the earliest parts of the theatre, as the choric dances formed the earliest feature of the Dionysiac festival long before the drama itself had become properly developed. Thus we have the explanation of the introduction of the altar to Dionysos in combination with plays which make no reference to the "cult" of that deity. At one side a segment of the circle of the orchestra was cut away by the stage proper, the σκήνη or λοφεῖον with a background, and three entrances for the principal actors. We are told that Mr. Godwin chose as his model for the palace of Priam the so-called Temple of Empedocles of Selinus, in Sicily. Be this as it may, no fault can be found with his attempted restoration, though the mural decoration points to a later period than the age of Sophocles, which we were to accept as the supposed date of the performance. But he was right in not attempting at restoring the building in accordance with the very slight indications of early Greek art, the rather as in all probability no such archæological realism would have been attempted on the Athenian stage. The distant view of the coast in the background, beyond the walls, was very effective, and not out of keeping with what we have reason to believe the scenic decorations in the period of the developed drama was like. No doubt in the earliest drama the arrangements as regards scene-painting were very rudimentary, but towards the close of the fifth century B.C. the important position of scene-painting in the development of pictorial art, beginning with the painter Apollodorus, and the minuter drawing of characters and action in Sophocles and Euripides, must have called for a far more elaborate system of scene-painting than antiquaries have hitherto admitted in connexion with the problematical ἐκκύκλημα. On a level with the orchestra, just where the extension of the stage beyond the orchestra (the παρασκήνια) begins, are doors through which the chorus enters the orchestra, while marble steps lead up the centre to the stage proper. These steps in the Greek theatre were probably of wood, and movable. We were glad to find that Mr. Godwin introduced polychromatic decoration into his architecture, and also used curtains freely. Without these important adjuncts Greek architecture loses much of the life it undoubtedly possessed. He might even have been bolder and more decided in the application of colour. So also the colouring of the reliefs added much to the effect. In the front of the stage slabs from the amazon-frieze of Phigalia were let in, and these were given a dark red background, while the figures were gilt. Perhaps some reliefs of Dionysiac import might have been more appropriate. Even the modernness of the galleries and boxes was relieved by the introduction of casts from the Parthenon frieze, to which a blue background was given, while the relief remained white, giving them a little too much of a Wedgwood appearance.

The dresses were very good and appropriate. The fifteen Greek maidens of the Chorus were draped in white, with the long *himation*, and a kind of *diploïs* like the figures from the frieze of the Parthenon. As they entered in procession, and swayed rhythmically to their own singing, or, while the action was proceeding on the stage, sat in graceful attitudes below the stage, one realised how the stage with the Chorus presented to the Greeks the living and moving sculpture which has been lost to us with the introduction of the gauzy petticoat and tip-toe rope-walking of the *corps de ballet*. The dresses of the actors were also very successful. The best, perhaps, was the Tirewoman to Hecuba (Mrs. Jopling), who also, it appears to us, was most graceful in attitude and most perfect in gesture. The dress of Paris, the archer, was effective and correct according to ancient representations. He wore the close-fitting garment which distinguished the Oriental archer, and the Phrygian cap. Perhaps he might have held his bow, or worn a quiver, instead of the sword, which became singularly obtrusive in the superfluous business of kissing it before he dies. Throughout the acting was very good.

But in both these plays a deficiency, not only of the modern stage, but of modern life, became most manifest, namely, the universal awkwardness in walking and in standing. It is certainly due to our dress, but actors in Greek plays ought to study it carefully. Ancient reliefs and statues will show each phase in the act of walking. When the one foot is advanced the other foot turns outwards while rising on the ball and is then moved in an outward circle forward, whereas modern walkers keep the foot at one angle and raise it at once. This Greek walk must not be confused with the ordinary abrupt stage-walk. In standing, the modern Paris dress, especially in its treatment of the waist, has caused women to bend their back in too much. In Greek dress the outline of the figure, when the modern attitude is maintained, is decidedly ugly. One slim and fair lady in the Chorus was very graceful in her attitudes, and might easily have been taught to walk as the most graceful figure from a Greek frieze would have walked in life. Ignoring these slight defects, we must feel that we witnessed a sight never to be forgotten, and one which seemed to take us for the moment far away from London and modern life.

NOTES.

THE principle of Mr. McLaren's Purchase of Land Compensation Bill, which was read a second time last week (May 12), is sound enough. Practically its object is to enable those bodies which take land compulsorily to set off any advantages to the property left, against the disadvantages arising from taking land compulsorily or from their undertaking. It is quite clear that if without doubt the undertaking will improve the value of the property it is not right that credit should not be given, so to speak, by the arbitrator for this advantage when he comes to assess the compensation which is payable. The difficulty in regard to the scheme is in carrying it into practical effect, because while the disadvantages to the property are clear, the advantages are very often problematical, or such that they will not be a benefit to a property in its existing state. Suppose a piece of land near a house and grounds were taken, cutting off access to a river or home farm, the loss to the owner of the property as a residential one may be clear, the gain in the proximity of a station may altogether depend on the future train service. Still, if the principle of a Bill is sound it should pass its second reading, but whether this particular one if it becomes law will be found to have much practical effect seems very doubtful. However, the chance of such small fry as this obtaining the royal assent during the present session is not very promising.

THE statistics of deaths by fire, as recently set forth by Dr. Choquet, are of very considerable interest, and especially those cases which have happened in theatres and places of public resort. The latter, indeed, have been extremely prolific in this kind of calamity, no fewer than 7,000 persons having been burned between 1751 and 1885. The first ten years of this period showed only 179 victims, of which Paris supplied 21,—a proof that places of entertainment were relatively few and far between; and things went on pretty quietly until between 1790 and 1800, when it mounted up to 1,100, of whom 1,000 were burned to death all at once at a place in Istria, probably the largest human hecatomb on record. America took the lead in the next epoch from 1801 to 1830, although the total number of deaths was only 227. In the following decade, St. Petersburg had more than one large fire, by which 800 persons came to their end; but this number was greatly exceeded between 1841 and 1850, the total of deaths amounting to 2,144. Of these, 1,670 were carried off at one swoop in a Chinese theatre at Canton, and 200 more in a Canadian theatre at Quebec. The next twenty years showed a relaxation in the roll of deaths from this class of accident, there being only 345; but there was a great increase in the next fifteen, the total amounting to 1,845. It must be remembered, however, that there has been within that period a great development of theatrical entertainments in all the large cities of the world, though, on the other hand, the means for providing for the safety of visitors have been very much more attended to than formerly. Paris, with its numerous minor theatres and *café-chantants*, has been, on the whole, remarkably free from deaths by fire, not more than 71 in twenty-five years. This is not bad, considering that the theatres number 32 and the *café* concerts 56, which are visited yearly by at least eight million people. Considering, too, that the Porte Saint Martin has been burned twice in the present century, and the Ambigu-Comique, the Gaieté, the Italien, and the Vaudeville each once, it is surprising that the total deaths at these occurrences only amounted to five, the fires fortunately happening when the theatres were empty.

WE in England are generally credited with an undue degree of Philistinism as regards art matters. It may, perhaps, be some consolation to know that other countries are as bad as ourselves, and that even Italy, with her professedly artistic life, is not always free from blame. A proof of this is shown in the art history of Florence. In 1431 Lucca della Robbia built a beautiful singing-gallery for the Duomo, while two years afterwards, Donatello made another to match it, the bas-reliefs on these being objects of the deepest admiration. In 1688, when the wedding of Prince Ferdinand with a Princess of Bavaria was celebrated, these galleries were taken away to make more room, and placed in one of the rubbish chambers belonging to the cathedral works, and there they remained until 1845, when they were taken to pieces and put into one of the magazines of the fortress, whence they found their way into a cellar in the Chapel of the Medicis. Finally, Professor De Fabris found them in 1876 in another cellar, covered over with mud brought in by the Arno, which had overflowed into it. The bas-reliefs, however, had been taken off the galleries and were stored away in a dark room forming part of the building occupied by the *employés* of the Duomo, not only utterly unknown to the public, but as described in a current document "*Mala mente visibili*,"—scarcely to be seen, at all events, without the aid of a lantern. From this ignoble position they were eventually rescued, and placed where they are now in the national museum known as the Bargello. The ten bas-reliefs of Lucca della Robbia, the subjects of which are singing and dancing boys and girls, are probably some of the most exquisite groups, both in design and execution, that can be found all the world over. The whole story has a striking resemblance to that of the underground marbles in the British

Museum, though with the difference that there seems to be no immediate prospect of deliverance for the latter.

AGAIN the old, old story. Such may exclaim any one who takes note of the case of Botterill *v.* The Ware Board of Guardians just decided by the Court of Appeal. It is the old story of a contractor suing his employer, going into an expensive litigation, and being held not entitled to recover, because there was no final certificate from the architect or the engineer as the case may be. "It is common," said Lord Justice Bowen, "for contractors who put themselves in the power of the engineer, or surveyor of the employers, to bring actions under a sense of supposed wrong, in the wild hope of somehow or other getting a decision contrary to strict law." That law is, that without a certificate, a contractor is not entitled to be paid, unless the certificate is withheld by fraud and collusion. It is true that in the case of Pawley *v.* Turnbull (Roscoe's "Digest of Building Cases," p. 27), a builder was held to have a right of action, because the architect in regard to the certificate had acted "improperly and unfairly." But such impropriety and unfairness must by the light of the last case in the Court of Appeal and other decisions of tribunals of less authority, clearly be such as in the eye of the law would be equal to fraud. The lengthy and expensive litigation, the cost of which will be borne by the plaintiff in this case, should be a warning to all contractors not to enter on these forlorn hopes. We have over and over again pointed out the sanguine recklessness with which contractors enter into contracts by which they are absolutely at the mercy of engineers and architects, and how futile it is at the eleventh hour to try and escape from the bonds they have made for themselves. The cost of an arbitration of twenty-two days, or of a trial before a judge, and an appeal to the Court of Appeal are the substantial items to set on the debit side against the sum of 670*l.*, which the defendants were willing to give the contractors, not as their legal right, but simply from good nature.

THE *Daily News* of Monday last admitted to its columns what can only be described as the despairing wail of a confirmed and unreasoning "Anti-Scraper," in the form of a letter from a correspondent "N. M." He writes :—

"There remains in London one ecclesiastical building of the twelfth century yet unrestored, and lovers of early Mediæval art have been hoping that this one had been overlooked by the destroyer, ycleped restorer. It appears now, however, that the fiat has gone forth. To-morrow, perhaps, an army of irreverent scrapers will be turned loose in the venerable church of St. Bartholomew the Great, with instructions to obliterate every trace of antiquity from its walls. There is, perhaps, only one way of preventing this dreaded consummation, which is to withhold the supplies ; and it is devoutly to be hoped that the subscriptions to the restoration fund will be only sufficient to meet the really necessary repairs, so that the restorers may be restrained by lack of means from undertaking any works tending to rob the church of its venerable appearance."

We wonder whether the writer of these rabid sentences saw the interior of the church as it was up to within a week or so ago ? The idea that "lovers of Mediæval art" could have indulged the hope that the church would be allowed to remain in its deplorable and despoiled condition is absurd to a degree only equalled by the audacity with which it is assumed that "an army (!) of irreverent scrapers" will be instructed "to obliterate every trace of antiquity" from the walls of the building ! The writer either does not know what is proposed to be done, or he wilfully misrepresents the proposals of the Committee and their architect. His diatribe would not be worth notice in these columns except as a specimen of the length to which some of the neck-or-nothing "anti-restorers" can go in the direction of wild and baseless assertion.

THE project for the erection of a St. Gothard monument, in commemoration of the piercing of the tunnel through that mountain has now taken a definite form. It was originally intended to place the monument in some prominent position on the mountain, either at Gœschenen, on the Swiss side, or at Airolo, at the Italian end of the tunnel, but this has been abandoned, and it has now been determined to erect the work at Lucerne. A model of the monument has already been executed by the well-known sculptor, M. Richard Kissling. According to the new plan an artificial island is to be constructed in the Lake of Lucerne, not far from the quay, and near the Schweizerhof, which is to serve as the pedestal. The sculptor's work represents a young man, mounted upon winged wheels, personifying the genius of the age of steam travelling. On two of the sides of the socle will be medallions, containing the busts in relief of the engineers of the tunnel, MM. Louis Favre and Alfred Escher.

POLITICAL disturbances in Greece happily do not seem so far to have retarded archæological work ; the excavations of the French school have begun again at Delos, and the Δελτιόν τῆς Ἑστίας (No. 474) reports that the American school is just about to set to work at a systematic exploration of the ancient theatre at Thoricus. "Thoricus et Brauronia, olim urbes, jam tantum nomina," so wrote Pomponius Mela in the first century A.D., and it is noticeable that Pausanias makes no mention of the place : probably the ruins were inconspicuous. Since then the fortunes of Thoricus (now Port Mandri or Theriko) have looked up again. Important mining operations from the Laureium mines are carried on there. To some of us the place still owes its sanctity to Makronisi, the "Long Island" which shelters its harbour. There Helen rested when she fled with Paris. The theatre, which is to be the scene of the American excavations, is noted for its unusual form ; it has also a pointed gate similar to the one at Tiryns. On the promontory of the town the ruins of the fortifications built by the Athenians in the Peloponnesian war still remain. There is also, on the west side of the theatre, a Doric building, the purpose of which is uncertain.

SOME "Proposals for Antiseptic Drainage" made in a pamphlet, sent to us by Dr. J. M. Lownds,* indicate that he has not much practical acquaintance with the subject, although he writes of sewage, sewage-farms, reservoirs, and pumping-stations as if he had. The working of his proposed system would come to a deadlock in a hundred places at once, in a town even of the 20,000 population he mentions, to say nothing of London, of which he makes further mention. There is one saving proposal, and that is all. Where a cesspool must be made for the reception of liquid sewage, Dr. Lownds proposes to cover the surface of the liquid with a film or layer of "oil containing about ten per cent. of an antiseptic such as terebine oil, crude creosote, carbolic acid, &c." He has for eighteen or nineteen months preserved urine in a glass vessel exposed to sunlight, air, and heat in a conservatory, "free from decomposition and smell, as at first, and the mucus is just as it appeared when it settled down." Where it may be proper to prevent this decomposition the method might be tried, as it seems to effect the purpose.

THE drawings made for Mr. Ruskin for "St. George's Guild," and which are on a screen in the same room with Mr. Goodwin's drawings of the Fine Art Society's galleries, are exquisite specimens of what illustrative drawing of architecture should be, a large portion of them being of architectural subjects. The artists are Signor Alessandri, Mr. Frank Randal, Mr. Fairfax Murray, Mr. T. Rooke, and Mr. W. G. Collingwood. Mr. Rooke's drawing of one of the richly-coloured stained-glass windows from Chartres is a splendid piece of work, with almost the deep sombre glow of the glass itself. Mr. Randal's drawings of the porch and of the lion and dragon sculptures at the cathedral of Bergamo, and the Tabernacle at Santa Maria Maggiore at the same place, are models of illustrative architectural water-colour drawing. The whole of the small collection shows the most conscientious work, with a desire to realise the effect of the original, at whatever cost of labour and patience. Architectural draughtsmen and students should not miss looking at them.

* No publisher's name.

AT the International Art Exhibition to be opened in Berlin on Sunday, the 23rd, more than a hundred English artists will be represented. The total number of their works, to be shown in a separate compartment, will be about 130, of which sixty are oil-paintings, fifty water-colour drawings, and twenty sculptures. The Exhibition is expected to represent the best work of the leading German artists of the day.

THE Burlington Fine Arts Club have had on view for the last fortnight in one room in their house a small but very interesting and valuable collection of illuminations from manuscripts, principally Italian and French. These include some very large, fine, and elaborate pictorial initials, letters enclosing paintings, &c. ; there is very little of mere decorative borders or letterings, but there are one or two very beautiful Arabesque borders. The examples of the Venetian School include some cuttings from Ducal commissions ("Ducales") from the Venetian Senate to individual persons, officers, &c., in which the partrait of the Commissioner was usually introduced. These are very fine in execution, and, being as they are, mere ornaments to a State document, are worthy of the city of Titian.

FROM the *Berliner Philologische Wochenschrift* (May 15) we learn that Dr. Schliemann intends to crown the romance of modern archæological enterprise by the excavation of the oracle-cave of Trophonius. We were not aware that the exact site of this wondrous cave was known, but no doubt Dr. Schliemann holds the clue. The memory of Trophonius and his brother Agamedes is, no doubt, enshrined in the heart of every architect, so we need not recall the excellent stories that Pausanias tells of their buildings ; they were at work before Dædalus himself, they were men "dear to the immortal gods," men "wonderful at building temples for the gods and palaces for mortals," and above all things they built "strong treasure - houses" for Minyas at Orchomenos, for Hyrieus at Hyria, for Augeias at Elis. It is at Lebadeia (Livadia) that Dr. Schliemann intends to set to work, where the oracle of Trophonius was consulted by Croesus, and again by Mardonius. It kept up its prestige long after the other oracles of Bœotia were dumb. It may be that the cave still holds strange treasures of curious idols and quaint votive offerings. Anyhow, the exploration is the fitting sequel to Dr. Schliemann's work on the semi-mythical sites of Troy, Mycenæ, and Orchomenos.

AT Messrs. Tooth's gallery in the Haymarket there is opened to-day a collection of paintings by M. Tissot, entitled "Pictures of Parisian Life." These consist of sixteen paintings all of the same size, and arranged round the room as a series. They are not on the small scale and in the highly-finished manner in which M. Tissot used to paint London Society when he lived in England ; he paints on a larger scale now, and artistically in a far inferior manner ; the flesh tones are in too many cases crude and untrue ; the texture hard ; the figures on all the planes of the picture painted up to the same degree of force and brightness, at least in some cases, as in "The Amateur Circus," where the amateur clown in the ring seems to be on the shoulder of the lady in the foreground. Artistically, this is a great declension from the artist's old style ; but, in some other respects, the pictures are exceedingly clever and bitterly satirical. We are shown the "fashionable beauty,"—a soulless doll walking calmly between two rows of admirers ; the girl "without dowry," also a doll, and evidently waiting to

catch some one; the "political woman," who has married an old man she expects will become a Minister; the woman of fashion cloaking herself in the hall for her next rendezvous; "painters and their wives" sitting down to lunch after "varnishing morning"; the "provincial women" with their father, who have come too early to the Prefect's reception, and are open-mouthed at the splendour of the empty rooms. The manner in which the various shades of society are discriminated is worth note; the banking society in "the fashionable beauty" (who is only in a certain set) is quite distinguished from the style and manner of the personages in "The Woman of Fashion," who belongs to the best set. This is all very clever, but it is not pleasant, and the painter is no more in earnest than his personages. He has been producing a popular picture show; that is all. It is not a very high use of art; but the whole set of paintings is a curious commentary on Feuillet's recent novel, "La Morte."

ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

No. 1,628, "New Offices, Legal and General Life Assurance Society, Fleet-street," is another building by Mr. Edis, an example of the application of terra-cotta to street architecture, though the fact of the employment of terra-cotta is not indicated in the uncoloured pen-drawing in which it is shown. The ground-story, with a Roman triglyph cornice, is very richly treated; the porch of the principal entrance is carried on fluted columns with the lower portion of the shaft covered with sculptured or rather modelled ornament; a plain massive rusticated pier between the two windows gives further value to the decorated surfaces. The building serves to show how much decorative effect the employment of terra-cotta gives scope for, without extravagant cost, and (which is more important) in a material far less affected by London atmosphere than an ordinary building stone.

1,630, "Cheltenham Grammar School: accepted Design," Mr. Henry Hall. We published this drawing recently. The plan is not appended, as it should have been. The school, with large square mullioned windows, is set back from the road, a courtyard being left in front of it, flanked by residential blocks. It is a pleasing-looking building, suitable for its purpose.

1,631, "Almshouses at Charlton, Kent, built for Trustees of the Dutch Church, Austinfriars, E.C.," Messrs. I'Anson & Son. A plain brick building of Late English type, the centre apparently an administration block, higher than and projecting beyond the wings, which are "plain in their neatness." No plan.

1,632, "Business Premises, Foregate-street, Chester," Messrs. Grayson & Ould. An attempt to do something in keeping with the old Chester architecture, but in a more massive style. The ground-floor has round arches with no imposts, one bay an open loggia, after the Chester fashion; two bays forming shop-windows. The windows above are mullioned, and the gable finished with what would be corbie steps, only the angles are filled up with scrolls. Generally picturesque, but rather wanting refinement in detail, and a by no means good drawing, in this respect certainly not vindicating its favourable position on the walls.

1,636, "Premiated Design for the New Baths, Stockport." Mr. W. G. B. Lewis. A neat, domestic-looking building, with no show about it, but nothing in its character to indicate its object; it looks rather like a private house, with a one-story addition for billiard-room at one side. No plan.

1,639, "National Liberal Club: Whitehall-place Front," Mr. A. Waterhouse. A powerful but rather loaded water-colour drawing, giving an effective view of this part of the building, with the polygonal angle tower seen on the left. The effect of the balcony on heavy corbels running under the second-floor windows, and stopping against the sides of the projecting bays, tying the whole together, is well shown in this drawing, which generally conveys very well the massive character of the building.

1,641, "New Premises for the College of Preceptors, 2 and 3, Bloomsbury-square," Mr. F. Pinches. A building rather heterogeneous in detail; panelled pilasters *à la* Renaissance with Gothic cusping in the middle as an ornament; square-headed windows with mouldings receding as in Gothic work, but, nevertheless, with (apparently) the outer moulding standing out beyond the wall-face, as in a Classic architrave; the whole suggests an effort after originality by combining details not generally combined. The combination is not unsuccessful in itself; at least, it is not owing to that peculiarity that the building is not very pleasing, but to a want of general refinement.

1,646, "Council House and Art Galleries, Birmingham," Mr. Yeoville Thomason. The sort of architecture that delights the heart of your Birmingham man *pur sang*: large, costly, and respectable, without a spark of artistic feeling or originality. A good water-colour drawing of the architectural draughtsman style, with a sufficient number of carriages and people.

1,648, "Harrow School: New Museum and Class-rooms," Mr. Basil Champneys. A brick Queen Anne building, with the usual illogical details, which the fashion for a particular epoch alone makes people admire, but with a good many pleasant points of treatment in spite of this. The corbelled balcony running along part of one side, with the picturesque bay windows at each end, is one of these; also the open arcaded staircase in the angle of the other front. No plan; so that we cannot tell the least how far these architectural features lend themselves to the arrangement of the plan, or express or emphasise it.

1,655, "The Guildhall School of Music, now being erected at Blackfriars for the Corporation of London," Mr. Horace Jones. We gave the elevation of this building some time ago. It is a square Italian building, with rusticated ground story, very plain, the only special feature being the insertion of carving in the spaces which would otherwise be the second-floor windows, excepting the end ones; this portion of the building being raised higher than the rest, and we presume marking the concert-hall. No plan. The building is, we very little doubt, practically suitable to its purpose, nor does the exterior sin against good taste in any way; but its purely architectural merits are certainly of too negative a description to have been worth all this paper and colour and wall-space.

1,656, "Design for the Mappin Art Gallery, Sheffield," Mr. J. D. Webster. This, we imagine, should have been labelled "competition design." It is not the selected one, but, as far as exterior architectural design, it is as superior to the selected one as light to darkness. No plan; and therefore we cannot form any judgment as to whether the arrangement and practical treatment of the building would or would not have justified its selection. The building has something the look of a Classic church in outline and composition. It has a very picturesque octagonal turret and a large semicircular annexe, the lower story of which forms an open porch. The remainder of the building is apparently in a three-aisled form, with clearstory windows, which would not be much seen from below and are plainly treated, with the practical object of giving as much light as possible. The outer side walls are solid and pilastered, with statues in niches between the pilasters. It is shown in an admirably-executed pen-drawing. It is a great pity the author did not add a small plan and section to indicate his practical treatment of the building. The exterior treatment is very pleasing and original.

1,662, "Chelsea Vestry-hall," Mr. J. W. Brydon. A large elevation of this Queen Anne vestry-hall, the centre portion of which seems to be modelled on details from St. Martin's-in-the-Fields. We illustrated the design at the time of the competition.

1,665, "Cheltenham Grammar School: competitive design," Messrs. P. Thicknesse & W. E. Willink. A design showing the same general arrangement as the accepted one, the school thrown back, and accessory buildings flanking the space in front, so that, we presume, this general arrangement was part of the programme; but in this case the end of the school building is turned to the road, instead of the side. The building is a great deal more picturesque one than the accepted design, but as no plan is given with either, it is impossible to give any judgment as to their real practical merit for the purpose for which they were intended.

1667, "Salcombe College, Loughton," Mr. James Cubitt. We presume a girls' school, treated in a picturesque, homelike style; an attractive building to arrive at, as a girls' school should be. No plan.

1,669, "London and County Bank, Kensington: New Premises," Mr. Alfred Williams. A richly-treated elevation of Late Gothic detail, the bank duly marked by large mullioned windows on the ground story. Some of the details are of Early Renaissance type, but mixed with details more decidedly Gothic than are usually found in this combination. It is not refined architecture, but it is a creditable attempt to give something more of architectural effect and interest to a bank than bankers usually care for; this class of professional men being in general, for some reason, more utterly and stolidly opposed to architectural beauty or picturesqueness than any other class; the bad effect on the mind of continually handling money, we presume.

THE "SHIPPERIES" EXHIBITION, LIVERPOOL.

As the various sections of this Exhibition are got more into shape, its real scope and interest become more apparent. But there is still an immense amount of work to be done before the display can be said to be complete. The workman's hammer is heard in all parts of the building, and empty stalls are gradually filling. But the annexe set apart for "machinery in motion" remains almost a chaos, and it must be some weeks before the whole of its contents can be in working order.

The most conspicuous, perfect, and not the least interesting section of the exhibits is that of the marine models, which are arranged on each side of the central main avenue; and from a scientific point of view, as illustrating the history of shipbuilding in Great Britain, and, indeed, also in Europe and America, during the last century, this collection is highly instructive, not only to the shipbuilder and engineer, but to all men of intelligence. The list of exhibits in this department occupies fifty-six pages of the printed catalogue. These models are for the most part of excellent workmanship, and are contributed by the Royal Naval College, Greenwich; the Bureau Veritas, Paris; Messrs. Laird Bros., Birkenhead; Sir W. G. Armstrong & Co., Newcastle-on-Tyne; the White Star Line, Liverpool; Messrs. Henderson Bros., Liverpool; D. J. W. Henderson & Co., Partick, Glasgow; the Cunard Steamship Company; Inman Steamship Company; National Steamship Company; Cayzer & Co., Glasgow; Guion & Co., Liverpool; Denny Bros., Dumbarton; John Reid & Co., Port Glasgow; R. Napier & Sons, Glasgow; G. L. Watson, Glasgow; Messrs. Alexr. Richardson and St. Clair Byrne (both naval architects, of Liverpool); the Liverpool Model Yacht Club, &c.

The specimens of naval architecture thus brought together of course form one of the chief features of an exhibition whose very name implies that the illustration of the shipping of the civilised world and its appliances is its almost main object.

This series of models comprises nearly every known class of vessel. The iron-clad man-of-war (in many instances accompanied by drawings and sections explanatory of the construction), the ocean liner, the cargo-carrying sailing ship, the Channel passenger steamer, the steam yacht, the river-ferry and towing steamer, and the most modern type of cutter and schooner yachts. Along with these are many examples of our now-obsolete wooden sailing frigates and other wooden ships, down to the collier brig of a century ago. There are also excellent models of past and present light-ships, lifeboats, &c., showing all their arrangements and equipments. A more complete marine show has probably seldom been got together.

As connected with steam navigation, Mr. John Dickinson, engineer, of Sunderland, exhibits a patent crank shaft, made of separate pieces and fitted together with screw bolts, and thus capable of repair at sea. It is essentially, he says, a "built shaft," being more easily taken to pieces and put together than any other shaft extant; and in the event of a flaw taking place in any part of the shaft, that part may be replaced at a fraction of the cost of the whole shaft. By carrying a spare web and pin and two shafts, should a breakdown occur at sea, the faulty part could easily be replaced by the

engineer and assistants without the expense and risk of taking the ship into port. A sound forging is ensured in the shafting owing to its being made in short, straight, easily-handled lengths. The shaft exhibited is a very fine piece of workmanship. The web and pins are cast-steel, and the forgings of iron or steel. We are informed that several steamers have been fitted with this shaft.

Messrs. Vicars & Co., of Sheffield, exhibit two screw-steamer blades of cast steel, duplicates of those supplied by them to the Cunard steamers *Umbria* and *Urania*, of 7,000 tons. Messrs. John Brown & Co., Atlas Works, Sheffield, have a Siemens steel furnace-front, flanged by hydraulic pressure in *one* heat, as made for the steamers building for service at Queenborough. The same firm also show an Ellis's patent steel-faced armour-plate, tested by a twelve-ton service gun with chilled cast-iron Palliser projectiles (256 lb. weight each), charged with 50 lb. of powder, at a range of ten yards. The result of three shots in different parts of the plate is an indentation in each instance about half way through, but scarcely any bulge or crack is visible at the back of the plate, which is a 10-in. one. Had the plate been of iron only, it is said it would have been pierced completely through; or if of steel only, it would have been broken up into pieces.

The "Mersey Forge Company," and Messrs. C. Cammell & Co., of Sheffield, show some massive iron forged-work for cranks and main shafts for large ocean-going steamers.

Messrs. Doulton's Trophy, which we mentioned in last week's notice, next attracts attention. This structure, which is in itself an exponent of the use to which Doulton ware may be applied in decorative art, is a pagoda-like design, square in plan, and entered by arched doorways from all four sides. There are also four detached stands, ornamented with porticos, &c., situated at each corner of the area formed by the dome of the Exhibition Building, under which the whole group stands. Their furnishing is not yet completed, but the centre trophy is intended to contain samples of Doulton ware in all its applications, besides some specimens of stained glass produced by a new process; while the corner stands are to exhibit stone-work, fire-proof flooring, chemical ware, sanitary appliances, &c. It will probably be a fortnight before these stands are really finished.

The New Ferry Brick Co. exhibit some good moulded brickwork, of a uniform brownish-red colour, the decorative devices being generally sharp and well formed. The "lock-jaw" roofing tiles patented and manufactured by Mr. Charles D. Phillips, of Newport, Mon., have been chosen by the Aylesbury Dairy Company for the roof of their extensive building.

Among the exhibits from Douglas are specimens of a fine-grained grey limestone from Castletown. It is stated that Castle Ruthin was built with stone from the same quarry 900 years ago, and that it is in almost as perfect a state as when first erected. Messrs. Stone Brothers, of Bath, have on view specimens of a Bath stone which they claim to be specially durable. They quote a report of Mr. J. L. Pearson's upon work completed twenty years ago with it, and which had been exposed to the direct action of the sea. Mr. Pearson says:—"I found it had acquired a hardened surface on which the weather seemed to have had no influence, and I found it had deepened in colour to a rich yellow tint, toned down in places by a grey lichen which had grown on its surface, and which is a sure sign of a good weather stone."

Messrs. Fred. Jones & Co., of London, devote a stall to their patent silicate cotton, or "slag wool," for making walls, partitions, ceilings, and floors fire and sound proof,—the best material for the purpose which has been brought out; and Mr. T. I. Constantine shows specimens of his "Treasure Cooking Ranges." Messrs. Pendleton & Co. exhibit Wright's patent "As you Like it" grate, which we described and illustrated in our issue of Oct. 17, 1885. Mr. Muller, of Birmingham, has a gas apparatus for lighting places where coal-gas is not attainable. This gas being produced without fire or heat, he calls it "The Alpha patent Air-gas Apparatus." It is a compact and portable machine.

In the machinery department proper, the most striking objects at present on view are locomotive engines. One, called the "City of Liverpool," manufactured at the Crewe works of the London and North-Western Railway, is a remarkably fine piece of workmanship. It is one of the three-cylinder compound passenger engines, on Webb's system, which we before noticed in the Inventions Exhibition, and has two high-pressure cylinders, 14 in. by 24 in.; one low-pressure ditto, 30 in. by 24 in.; and coupled driving-wheels 6 ft. 3 in. in diameter. Among other locomotives is the "Victoria," by Messrs. Sharp, Stewart, & Co., of Atlas Works, Manchester, made for the Lancashire and Yorkshire Railway; and one by Messrs. Black, Hawthorne, & Co., Gateshead-on-Tyne, made for the Brazil Great Southern Railway. This latter is fitted with elaborate iron "guards" back and front, for removing obstructions.

In strong contrast to these powerful modern machines is their neighbour, "Locomotive," said to be the first that ever drew a passenger train on any railway, and which is the type of engine which led up to the construction of Stephenson's "Rocket," which figured at the opening of the Liverpool and Manchester Railway a few years afterwards. Certainly in its small size and feeble and elementary appearance it sets off to advantage the modern work among which it stands, and illustrates the enormous strides which have been made in mechanical engineering during the last half-century.

Messrs. Schaffer & Budenberg, of Glasgow, exhibit their patent pressure and vacuum gauges, patent hydraulic gauges, automatic expansion regulator with governor for steam-engines, and other inventions.

Messrs. Moser & Sons, of Borough High-street, London, have their patent fan-forges and fan-blowers on view. Their improvement on others consisting in the construction of the fan, and the method of driving it, by which they are said to be the most powerful yet produced, the use of bands being avoided, and fly-wheel and multiplying-wheels substituted.

Messrs. Henry Pooley & Son, of Liverpool, exhibit a variety of their weighing-machines and weigh-bridges, but their most important exhibit is a set of their locomotive engine balancing tables, fixed in the main avenue. These tables are eight in number, arranged in pairs, and so adjusted as to give separately the weight distributed on each wheel of an eight-wheeled locomotive engine.

Messrs. Lockwood & Carlisle, of Eagle Foundry, Sheffield, have their "patent double-action metallic piston packing-rings and spring" on show. With these they claim to secure thorough steam-tightness with the least possible amount of friction; springs that are not liable to break or lose their action, and may be simply and easily adjusted when required; in conjunction with a system of packing-rings which are at once strong, elastic, and durable.

It is almost premature to enter into any detail as to the foreign contributions to the collection, for the galleries in which the Italian, French, and Belgian treasures are to be displayed are only just beginning to fill up their empty spaces. What is already to be seen gives great promise, however, that in productions of art, bric-à-brac, and articles of vertú generally, this portion will perhaps be the most attractive in the Exhibition.

In the Italian Court, for instance, A. Bauer, of Florence, has a beautiful selection of ebony inlaid with ivory, carved work in oak and walnut, &c.; and in both the French and Italian Galleries some apparently fine marble sculptures are in course of arrangement.

Among the miscellaneous exhibits, which it is impossible now to particularise, there are many of great interest and value. The Liverpool trophy of imports and exports is a commanding and interesting object. Messrs. Elkington & Co. have an extensive collection of silver and plated goods, including two large shields executed in *repoussé* work. The principal pianoforte and other musical instrument manufacturers are largely represented. Messrs. Gruisen & Son, Dreaper, Cramer & Co., Metzler & Co., and others have each exhibitions of pianos, chamber-organs, &c., showing the most recent improvements in their construction. Messrs. R. J. Ward & Son, of Liverpool, exhibit brass instruments and flutes in the actual course of making. Messrs. Charnot, of Wardour-street, London, have also a good show of stringed instruments.

In the grounds outside the Exhibition building an "Ashantee Village," an "Indian Pavilion," and a "Settlement of Laplanders" are in course of preparation.

The late bad weather has, however, greatly impeded the outdoor operations; but with the return of sunshine and the result of a few days' labour, both the exterior and interior of this very extensive Exhibition will no doubt wear a greatly improved aspect.

VINEGAR-YARD AND AN OLD PLAY-HOUSE.

A MEMORIAL OF DICKENS.

For shouts were heard mid fire and smoke,
And twice ten hundred voices spoke,
"The Playhouse is in flames!"
And lo! where Catherine-street extends,
A fiery tale its lustre lends
To every window pane.

Rejected Addresses.

The offices of the *Builder* in Catherine-street look out towards the back on to a little plot of ground, barely one rood in extent, which has apparently escaped the notice of London topographers. Whatever may be its previous history, this piece of land now belongs to the parish and church of St. Mary-le-Strand, whilst its elevation above the surrounding level indicates how freely it was used for interments. A long-neglected and, until recently, noisome open space, it sometime ago came to the notice of the Metropolitan Public Gardens Association, and a faculty having been obtained, the rector of St. Mary-le-Strand, the Rev. Canon Tugwell, gladly giving his consent, the space has, at a cost of 180*l.*, been made presentable by being covered with tar pavement, a small flower-bed being provided and a couple of trees planted, though the space is so hemmed in that any attempt at anything ambitious in the way of horticulture or arboriculture would be futile. A number of seats have been placed about the ground, and an appeal is made by Lord Brabazon for funds for the erection of "a handsome drinking-fountain, in memory of Charles Dickens," for this burial-ground is by many people believed to be the one so graphically described in "Bleak House," where poor Jo's only friend "Nemo" was interred, and at the gate of which Lady Dedlock was found dead.* Dickens describes the graveyard in question as,—

"A hemmed-in churchyard, pestiferous and obscene, whence malignant diseases are communicated to the bodies of our dear brothers and sisters who have not departed; while our dear brothers and sisters who hang about official backstairs,—would to Heaven they *had* departed!—are very complacent and agreeable. Into a beastly scrap of ground which a Turk would reject as a savage abomination and a Caffre would shudder at, they bring our dear brother here departed to receive Christian burial. With houses looking on on every side, save where a reeking little tunnel of a court gives access to the iron gate, with every villany of life in action close on death, and every poisonous element of death in action close on life,—here they lower our dear brother down a foot or two; here sow him in corruption to be raised in corruption, an avenging ghost at many a sick bedside; a shameful testimony to future ages how civilisation and barbarism walked this boastful island together. Come night, come darkness, for you cannot come too soon or stay too long by such a place as this. Come straggling lights into the windows of the ugly houses; and you that do iniquity therein do it at least with this dread scene shut out. Come flame of gas burning so sullenly above the iron gate on which the poisoned air deposits its witch-ointment, slimy to the touch."

This is no very exaggerated picture of the condition of many town graveyards thirty-five years ago, and it is asserted that Dickens's graphic pen had much to do in hastening the closing of urban burial-grounds. While speaking of the alleged associations of the place with Dickens's "Bleak House," we may be permitted to point out that the Metropolitan Public Gardens Association, with the *Daily Telegraph* and the *Morning Post*, are incorrect in assuming that Dickens's appellation of "Tom-all-Alone's" was given by him either to the burial-ground or to the courts immediately surrounding it. At the end of chapter xvi. of "Bleak House," Jo, having had a piece of gold given him by Lady Dedlock at the gate of the burial-ground, is described as "setting off" for "Tom-all-Alone's," stopping "in the light of innumerable gas-lamps" to look at the coin. This passage alone justifies the inference that in Dickens's mind the burial-ground and "Tom-all-Alone's" were some little distance apart.† We believe that it is the opinion of many students of the topography of Dickens's London that "Tom-all-Alone's" was situate in Great Wild-street, a street a little to the eastward of Drury-lane, and the description given of the locality in the chapter already mentioned seems to confirm that view. The

* But it is to be observed that Hawdon, the law-writer, and the "Nemo" of the tale, died at Krooks's house in the court off Chancery-lane. This is not in the parish of St. Mary-le-Strand, and, therefore, his burial should not have been located in the ground under notice.

† Since these lines were written we notice that the *Daily News* has called attention to the mistake.

point is of interest because Dickens's descriptions of some of the scenes of his stories are realistic word-pictures capable of identification by those whose knowledge of London forty years ago was, like Sam Weller's, "extensive and peculiar."

This small, but, to the poor children of the neighbourhood, very acceptable playground, was formally opened on Wednesday afternoon by Lady George Hamilton, and amongst other noblemen and gentlemen present were Lord Dorchester, Lord Fortescue, Col. Burges, the Rev. Canon Tugwell, Mr. J. T. Bedford, C.C., Mr. F. H. Fowler, Mr. Cross, Mr. Augustus Harris, Mr. A. M. Broadley, and a large number of ladies and gentlemen interested in the beneficent work of the Association. The formal part of the proceedings being concluded, the children of the neighbouring courts and alleys were admitted to the ground, and large numbers of them remained there until the closing-hour (eight p.m. this time of the year), exercising their limbs and their lungs. Before passing from this part of our subject, we may mention that of the few remaining headstones which are legible, one marks the burial-place of "Mrs. Betty Hadrill, many years housekeeper to the Royal Academy," who died April 28, 1803. This is of interest as recalling the fact that at that time the Royal Academy was located in Somerset House.

Separated from this neglected and well-nigh forgotten burial-ground by Vinegar-yard and Cross-court formerly lay, to the north-east, Vinegar-yard Garden. Until the building to which we shall hereafter refer, the Garden was latterly represented by the space between Drury-lane Theatre and a curtain-wall, which, curving from what is known as Lady Burdett Coutts's door, abutted against Marquis-court. At the Drury-lane end of Marquis-court remains as pretty a name-tablet, of the date 1763, as may be found in the town. At one time Vinegar-yard was a title frequent enough in London; in a few cases, — as in the district under review,— and also in St. Giles-in-the-Fields, in Aldgate, and in Bermondsey, it is most likely a corruption of the earlier and here and there still extant Vineyard or Vinegarden-yard, — marking the vicinity of a conventual pleasaunce. Peter Cunningham says it was built *circa* 1621, and cites from St. Martin's-in-the-Fields register an entry of the burial [probably in the adjacent Drury-lane ground] of "blind John out of Vinagre-yard," on 4 February, 1624.* But he does not mention the one name which should rescue it from oblivion. For in our Vinegar-yard was born Fanny Barton,—daughter of, it is said, a guardsman, — who, succeeding to Pritchard's and Clive's comic muse, was such a Miss Prue and a Lady Teazle as the world has never since seen, and whose face is familiar to us in the many portraits of Mrs. Abingdon by Reynolds.

In an essay of Elia, written *circa* 1825, Charles Lamb describes his first visit when a child "not past six years old" to Drury Lane Theatre. "My First Play" begins thus:—"At the north end of Cross-court there yet stands a portal, of some architectural pretensions though reduced to humble use, serving at present for an entrance to a printing-office." He goes on to say that this old doorway was the identical pit entrance to old Drury,—Garrick's Drury,—being all of it that was then left. Garrick's house was the second to occupy this spot, having been erected from Wren's designs, and, as Cibber recounts, opened on the 26th of March, 1674, with a prologue and epilogue from Dryden's pen. The poet had joined with Killegrew, Mohun, Hart, and others in the venture for this "new play-house." Its predecessor, burned down in January, 1692, formed the "King's House" so often mentioned in Pepys's theatrical gossip, which Killegrew opened on Thursday in Easter week, March 8, 1663, with Beaumont & Fletcher's "Humourous Lieutenant," the play beginning at three o'clock. Shortly after the Restoration Rhodes, a bookseller, rebuilt for the third time the notoriously offending Cockpit or Phœnix, a "private" house on the further side of Drury-lane, just southwards of the old Devil's Gap. His company, however, comprising Hart and Mohun (officers in the Civil War), Burt, and Mistress Betty Marshall, joined Tom Killegrew's, ceding their house to Davenant's troupe. These latter, with Kynaston and Betterton, removed in 1662 to the "Duke's Play-house," in Portugal-row, Lincoln's Inn-fields. Pitt-place, in Great Wild-street,* long preserved a memory of the Cockpit, which had shared more than once at Puritanical hands the fate of certain other houses, the neighbourhood's *dustênon oneidos*, which it was deemed to resemble in repute. Pitt-place, Prince's-court,† and Stewart's-rents (*antiquè*, Holford-court), together with Orange-court and Wild-passage, marked its site. These pestiferous alleys were demolished in 1881 for the Artisans' Dwellings erected by the Trustees of the Peabody Fund. Thus is gone every trace of a house where, before Commonwealth men gained the upper hand, were brought out Marlowe's "Jew of Malta," Heywood's "Woman Killed with Kindness," and, above all, Massinger's "New Way to Pay Old Debts." Closely associated with the dramatic triumphs of Dryden, Lee, Wycherley, Congreve, and Farquhar, Wren's house's was licensed in turn to Rich, Steele, Doggett, and Booth. Here Garrick first performed, under Fleetwood's management, in 1742, earning a salary of 500*l.* a year, and the nickname of the Whitefield of the stage. On September 15th, five years later, he opened the season, as Lacy's co-partner, with "The Merchant of Venice" and Dr. Johnson's incomparable prologue. Here he continued as actor, author, and manager, until, having sold his moiety for 35,000*l.* to Sheridan, Linley, and Ford, he finally took leave of the public on 10th June, 1776.

Together with Charles Lamb's delightful essay should be read, for the sake of contrast, that by Cumberland *à propos* of a same occasion, when taken under proper convoy to Drury-lane from Westminster School. His attention is riveted by Quin as Horatio, dressed in a green velvet coat, an enormous full-bottomed wig, rolled stockings, and high-heeled shoes, pouring forth his heroics, so diverse from his ordinary delivery, with dignified insolicitude. Mrs. Cibber as Calista sings in sweet recitative Rowe's harmonious strains. Mrs. Pritchard, as Lavinia, is so different, yet so much more varied, for however "ungenteel" in figure, she could pass with facile excellence from Doll Common to Lady Macbeth. Little Garrick, striving to reconcile his audience to naturalness on the stage, then young and alive in every feature and muscle, electrifies the house as he bounds on to the boards as Lothario. Heavens! what a transition! A noteworthy comment, too, on that day's fashions is afforded by Lamb's "Reminiscences,"‡ and a foot-note to the bill of June 10, 1776, being the very last play-bill in which Garrick's name is printed. It is the last night of the season; his final course of Shakspearean characters is concluded, and as Don Felix in "The Wonder" he is to bid farewell to the stage. The doors open at 5·30, the curtain rises at 6·30; "ladies are requested to send their servants a little after five to keep places to prevent confusion."

Referring to J. Gwynne's plan of 1766, we see that the theatre at that time was co-extensive with the auditorium of the existing structure. Four approaches severally opened through Vinegar-yard, Drury-lane, and the then Brydges and Little Russell streets. A passage ran from Little Russell (now Russell) street into Vinegar-yard. The front of Garrick's house had a handsome elevation, resembling somewhat Wren's Middle Temple gate in Fleet-street. A pediment, carrying at its two corners the royal supporters, couchant, and at the apex a trophy of arms, was sustained by five fluted pilasters resting upon a Palladian basement story having five spacious doorways. Destroyed by fire, the theatre was rebuilt by Henry Holland on so enlarged a scale as to accommodate 4,000 spectators. But this,—the third,—house met with a similar fate; for on the night of the 24th of February, 1809, after a brief life of but fifteen years, it was totally consumed. The existing house, designed by Benjamin Wyatt, was finished at a total cost of 150,000*l.* The Russell-street colonnade, of cast iron, and the portico in Catherine-street, surmounted by a leaden figure of Shakspeare, are more recent additions. The opening on the 10th of October, 1812, with a prologue by Lord Byron, is memorable for the publication in a thin 12mo. volume that year of the wittiest parodies, by the Brothers Smith, in the English language. Just within the semicircular wall, and facing Cross-court, stood the pit entrance spoken of by Charles Lamb. All traces of that relic have been removed for new "property" and store rooms, lately constructed under the superintendence of Mr. C. J. Phipps, F.S.A., architect.

* Singularly to say, in one or two maps of about 100 years ago this yard appears as Woburn-street.

* So named after Humphrey Weld, who built (1651) over the Aldwych Field property that had belonged at divers times to the Holford, Drury, Stradling, and Digby families.

† Part of Drury-lane, *temp.* James I. was called Prince's-street, but that style really belonged to the now newly-christened Kemble-street, a thoroughfare dating from the days of the Holfords and Drurys in Elizabeth's reign.

‡ His first visit was made in 1781.

SCULPTURE AT THE ROYAL ACADEMY.

To the works in sculpture by the President in this year's Academy we have already alluded, as also to the very remarkable and original work by Mr. Gilbert, "The Enchanted Chair." Among the other leading works in the exhibition, perhaps none will attract more attention than the figure of "The Sower" (1,924 in the lecture-room), by Mr. Hamo Thornycroft, of which we have the pleasure of giving in this number a sketch, made specially for our pages by the sculptor. As to the entire suitability of such subjects as this, and the well-remembered figure of "The Mower" by the same artist, to sculptural art, we have our reservations. We should scarcely like to see them executed in marble; the material seems too fine to bestow on such details as boots and gaiters. But, in plaster or terra-cotta, these life-size and life-like representations of figures in the garb of their every-day vocations have a very high interest; and "The Sower" is, perhaps, superior in artistic expression to its predecessor. The long, swinging stride with which the sower walks over the furrows is admirably given; there is no hurry in the action, which is sufficiently quiet and subdued to come within the proper domain of sculpture; the expression of the face is fine and dignified; the whole reminds us somewhat of the feeling of the figures in some of Walker's paintings of rustic life; like them, it seizes the best and most dignified phase of rustic character.

Taking the other sculpture exhibits in the order of numbering, we notice first Mr. Mullins's marble bust of "the late W. C. Worthington, F.R.C.S." (1,750), notable for the bold treatment of the marble, which is not polished up, but left with its crystalline surface and visible tool-marks. The bust of Dr. A. Carpenter (1,754), by the same sculptor, has the same characteristics. Whether the real object of a portrait bust in marble would not be better fulfilled by the old-fashioned treatment, showing the head and partly nude bust without any of the details of coat-collar and shirt-front, is a question to be asked. We have no particular fancy for the execution of crumpled shirt-fronts in marble. But in both cases the treatment of the countenance is in true sculpturesque feeling. Of Mr. Pomeroy's design, submitted in the students' competition for "Cain an Outcast" (1,751), we have already given an illustration (*Builder*, April 17) and commented on its high merits and promise as the deservedly successful design in the competition. Mr. Adams-Acton has a good portrait-statue of "David F. Carmichael, Esq., of Madras" (1,753), a seated figure so full of life and character that the drawback of the modern dress, so unsuitable for sculpture, is half forgotten. This in its way is one of the most successful works of the year. Mr. Nelson Maclean's marble statuette of "Comedy" (1,755) we have before noticed in speaking of a special exhibition of his works. Mr. Gilbert has a plaster bust of "Mr. Cyril Flower, M.P." (1,757), another of the realistic busts, which has a great deal of "go" about it; it is what old-fashioned people used to call "a speaking likeness." Miss Lipscomb's terra-cotta bust, "Day-dreams" (1,759), should be looked at as a very expressive head, slightly angular in contour, not strictly beautiful in feature, but with a beauty of a higher order than mere physical form.

Mr. Carl Müller's "George Burnard, Esq." (1,761), is another of the terra-cotta portrait busts, in which there seems to be an attempt to idealise the costume with some effect. Miss Susan Canton is a rising sculptor; her work this year is much in advance of what she has previously attempted. Her group, "What hast thou done?" (1,764), which seems to represent the Cain and Abel legend, and shows the instant of remorse after a murder has been committed, is, perhaps, over-accentuated in the anatomy of the figures; but it is a fine and expressive group on a small scale. Mr. Mark Rogers, jun., exhibits a marble "Caryatide for Chimney-pieces to the Saloon at Ashridge"

(1,766), appropriately placed so as to flank the door into the picture-gallery behind; it is a male figure, with head bent on the right shoulder, the left shoulder sustaining the cornice; a stain on the marble has an unfortunate effect on the nose and left eye, and the position of the figure is rather painful, confirming, in our eyes, the doubt we always have had as to the advisability of employing figures in this semi-constructional office, respectable as is the precedent for it. The figure itself, however, and the manner in which the vertical weight is taken by the left leg, is fine and sculpturesque. Miss Chaplin's "Lioness and Cub" (1,767) is an animal study of a larger size than usual with her, but quite equal in natural action to any of her smaller animal groups with which we are so familiar. Mr. Albert Toft is a name we do not remember before; but his "Study of a Young Man" (1,769), a terra-cotta bust, showing head and neck only, without any realistic adjuncts, is a very spirited thing; and so is his portrait bust of "Nelson Dawson, Esq." (1,801—lecture-room). He is a sculptor of whom one is likely to hear more. Signor Fontana's "Il mio fedele" (1,770), a girl and dog, is one of the "pretty-pretty" order of things, which delight children.

Mr. Brock's statue of Sir Erasmus Wilson (1,772), to be executed in bronze, and erected in front of the Infirmary at Margate, is a fine and very dignified example of portrait sculpture. The great authority on skin diseases is represented standing with clasped hands, and holding a book, the official gown which he wears furnishing the sculptor with a means of giving a broad "drapery" effect to the figure. Mr. Pinker's statue of "John Hunter (1,781), a bronzed plaster-cast of a statue presented by the Queen to Oxford University Museum, is, however, perhaps the most successful work in this class as regards energy and expression. The great physiologist is leaning with one elbow on something,—we cannot well make out what,—and looking forward with compressed lip and an eager face, something like that of the monk in the "Sentimental Journey," that "looked as if it looked at something beyond this world." Hunter's studies were prosaic enough certainly, yet he must have had the kind of persuasion of future fame which is so well expressed in this work.

Mr. Havard Thomas's "A Slave Girl" (1,774) is a realistic marble study of the figure, with little beauty, but not without pathos. The expression of the face is in keeping with the attitude of the hands, half extended, as if in deprecation of her position and treatment. Mr. H. Christie's "Spring" is a pretty plaster sketch of a girl playing with lambs, which may be instructively contrasted with the girl and dog group above referred to; the action in "Spring" is really natural and unaffected. Mr. Birch's colossal statue of "Major-General Earle" (1,786), which occupies a central place opposite the entrance, is only half successful. The figure is represented as advancing to or leading on an attack, sword in hand; but the action savours too much of stage warfare; there is not the energy of real combat in it.

The lecture-room contains a great many small things of merit which we have not space to mention in detail, and of course a certain proportion of commonplaces. The most important works in it next to those we have already mentioned are the bas-reliefs by Mr. Harry Bates. The first of these is "Homer" (1,811), who is represented by a figure not quite dignified enough for the ideal of the ancient bard, seated at one end of the panel, bent over a harp, while at the other end are two beautiful women, one seated, the other reclined, listening to him. "Socrates" (1,827), a marble relief, by the same sculptor, is the finer work. Socrates is seated on the right, in attitude and manner as if arguing and laying down a proposition; opposite to him a nearly nude young man sits in an attitude of deep thought, the hands clasped over one knee; two other figures are behind him; a young man also stands behind Socrates, leaning over him. The composition, from a decorative point of view, is beautifully balanced, the expression of the two principal figures, in countenance and attitude, very good. On the opposite wall is a cast of the first of the sculptured panels of St. George's Hall, Liverpool, which has been executed (1,872), and about which there has been some foolish depreciatory local criticism. It is by Mr. Stirling Lee, and represents "Justice as a Child of the Poor, led by Understanding into the Way of Wisdom, Joy following, strewing her Path with Flowers." So much meaning may be said to be a "rather large order" for one panel, and the nude child figure put to represent Justice is rather too young to have come to any years of discretion or any beauty of person; but the main treatment of the panel, with its broad surfaces and flowing draperies, is very sculpturesque, and eminently fitted to contribute to the decorative effect of the great Modern-Greek building for which it was designed. We presume the sculptor's intention was to show in further panels the stages in the growth of Justice; and we hope some more of them will be commissioned before long.

Looking round the room we note the design for the sculpture portion of the Sir John Goss Memorial, by Mr. Hamo Thornycroft, a panel in very low relief representing kneeling choristers. Mr. C. Calderon's "Fiore di primavera" (1,794), a very pretty female bust, should be looked at; and Mr. Onslow Ford's "A Hop-picker" (1,814), a bronze model of an old, seamed, weather-beaten face, pathetic to look at in connexion with the title. Mr. Lawson's "Summer" (1,823) is a piece of real sculpture. Like his "Spartan Dancing Girl" of last year, it is an expression in sculpture of a moment of repose in a body of strong and healthy physique, only this time it is a young lad who is the subject, who has evidently been bathing and is lying on his back on the bank, with his feet hanging down, in a moment of blissful indolence and enjoyment of warmth and sunshine. The figure is very finely modelled, and the work is altogether original. Miss Ada M. Palmer has made a success with her "Paolo and Francesca" (1,916), an alto-relief of the two heads only, very fine and passionate in expression, appearing to emerge from a background of drapery and flying figures.

Among the figures in the centre of the room, Mr. Onslow Ford's "Folly" (1,925), a bronze nude statuette, a little light-headed creature balancing herself on a bit of rock, with foolish gestures of her hands, is a very clever and original bit of invention. Among other works which we can only just mention as not to be passed over are "Contemplation," a bust (1,818) by Mr. Maclean; bust in marble of Sir James Paget (1,825), by Mr. Boehm; "The Young St. Timothy" (1,831), a nude child poring over a book, by Mr. A. G. Atkinson; "F. Johum, Esq." (1,851), by Mr. A. Drury,—a bust showing the head and neck only, with no artificial accessories, very spirited expression; "Portrait of a Lady," terra-cotta bust (1,865), by Mr. S. Fry; "Felicité" (1,871), a peasant girl from Cava di Tirreni, by Mr. Amendola; 'A Study" (1,891), a bronze bust of a calm female head, by Mr. E. Onslow Ford, a very good likeness in marble (bust) of the late Mr. Macdonald, of Aberdeen (1894), by Mr. Lawson, a reminiscence of a familiar figure who will now no longer be seen in his wheel-chair on private view days, welcoming the friends who clustered round him; a Dalecarlian peasant-woman (1897), by Miss Henrietta Montalba; "Diana after the Chase" (1,911), a new figure in an attitude of repose, by Mr. G. C. Cowell. There are some good little works among the smaller exhibits, which we have no space to particularise. There is certainly a high average in the sculpture work of this year.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ninth ordinary meeting of the present Session was held on Monday last, Mr. A. W. Blomfield, M.A., F.S.A. (Vice-President), in the chair.

Obituary.

Mr. William H. White (Secretary) announced the decease, on the 28th ult., of Mr. H. H. Richardson, of Brookline, Massachusetts, Hon. and Corresponding Member of the Institute. Mr. Richardson, who had only quite recently been elected an Hon. and Corresponding Member of the Institute, died very suddenly, having been at work twenty-four hours before his death. He was a native of New Orleans, but he went before the American War to Harvard University, where he graduated in 1859. At that time he was so good an American that he would not fight against the national flag. He, therefore, went to Paris, entering the École des Beaux Arts, where he took some honours, and was ultimately employed on the works of the Tuileries and the Louvre, when the two buildings were being joined together. Returning to the United States, he settled in New York for three or four years, and afterwards went to Boston, where his principal works were erected. Photographs of many of these were lately exhibited at the Institute. Mr. Richardson's reputation was not only great in the United States, but also in Europe. One of his chief friends was Mr. Hubert Herkomer, for whom he designed a house.

On the suggestion of the Chairman it was agreed to send a message of condolence to Mrs. Richardson.

Mr. R. Phené Spiers, as a personal friend of Mr. Richardson, said that his works had been described at the time of his election as a Corresponding Member of the Institute. He (Mr. Spiers) had placed in the library a design for a cathedral prepared by Mr. Richardson, which, although it had not been carried out, would show his great power of design, and careful study of French Mediæval work. His acquaintance with Mr. Richardson commenced when that gentleman came to Europe in 1859 to attend the École des Beaux Arts. Mr. Richardson came over to Paris, as most Americans did, with sufficient money to enable him to live at his ease, and take his studies as it suited him. On the breaking out of the American War, however, he was left without means, and was compelled to enter into some office to *faire la place*, as it was termed. This would have interfered with his studies, had he not devoted his evenings to continuing them in the *atelier*. Mr. Richardson had told him that the misfortune which came upon him in Paris was really in one sense the making of his fame, as he would probably never have taken a serious aspect of practical work unless he had been forced to obtain his living. The work he did in the Tuileries and Louvre also gave him a position when he went to New York, and helped him to a lucrative practice. Mr. Richardson was one of the few architects who were able to charge more than the ordinary 5 per cent., for so great was the demand on his artistic powers that he was obliged at last to confess that he could not do work properly unless he obtained the best possible assistance. He, therefore, would not undertake work for less than 8 per cent., and for many years he worked at that remunerative price. Mr. Richardson's last work was a very important one, and he hoped at some later date to be able to give more information as to this and other works of so eminent an architect.

The Charterhouse.

Mr. John Hebb.—With respect to the Bill lately before Parliament with regard to the Charterhouse, it was announced at a public meeting held at the Society of Arts the other day that the scheme then before Parliament had been approved by the Institute. It was a Member of Parliament who made this statement, which is, I hope, so unlikely to be correct that I think the Institute would be glad of the opportunity to give it some sort of denial. It may possibly have arisen from the act of an individual member of the Institute, who, being also a member of the committee to which the question was referred, did not consider it incompatible with his duty as a member of that committee to further a plan for building on the site, for running a road right through it, and entirely mutilating the buildings. It is a question of individual taste, and I suppose the Institute cannot help the action of its members individually; but, I think, in its corporate capacity the Institute would be rather chary of expressing any opinion with regard to proposals of this kind, and perhaps you may be able to say whether there has been any action taken by the Institute with regard to the Bill.

The Chairman.—I think, in regard to a question of this kind, that it would be more convenient if notice were given beforehand, so that one might have all the facts of the case ready. I am rather new to the post I occupy this evening, and was not present at any meeting of the Council,—in fact, I was not on the Council, when this question was considered.

Mr. J. Macvicar Anderson (hon. sec.).—I may say that no definite action whatever was taken by the Institute in the matter. The subject was brought before the Council by a member of the Institute, who is also an old Carthusian, but inasmuch as they did not seem to be entirely at one amongst themselves as to what was the

best course to adopt, the Council deferred any action, and no advice was given or action taken in the matter by the Institute.

Mr. Hebb.—I am extremely glad to hear it.

Roman Remains in North Africa.

Mr. Alexander Graham then read an exceedingly interesting and copiously-illustrated paper, entitled "Remains of the Roman Occupation of North Africa, with special reference to Tunisia." The following is an abstract of the paper:—

The author referred to the vicissitudes the Regency of Tunis has undergone since the Phœnicians from the Syrian coast formed their first settlement on its shores, and to the myths that surround its earliest history. It is supposed that Carthaginian literature was very limited, Greek being the language of educated Carthaginians, and that the principal records of Punic times passed to the library at Alexandria, and were destroyed by fire in the seventh century. There is nothing to show that the style of architecture introduced by the Romans into North Africa was influenced by the style of the buildings they found at Carthage, and explorations have favoured the supposition that the fine arts never flourished among the Carthaginians. This is the opinion of Winkelmann. The architecture in Tunisia during the five centuries of Roman occupation is as Roman as that of Rome herself. There is a dearth of inscriptions of the time of the first emperors, owing to the colony having been at first principally agricultural, but with the advent of Hadrian and Trajan and their immediate successors commenced a long era of wealth and prosperity. Roman Carthage no longer exists, but its treasures of marble and porphyry may be seen in the principal mosques and palaces in North Africa, and in Europe as far north as Pisa. The older Carthage of the Phœnicians is about 40 ft. under the surface, awaiting systematic exploration. The antiquity of Utica, one of the oldest known towns in the world, was then referred to, and a contrast was drawn between the present appearances of Bou-Chater (its modern name) and the city in pre-Roman times, with its massive walls and its strong position. The Punic and Roman methods of building, as exemplified by the remains of Utica, were then compared, especially with reference to the early use of *pisé* and of rubble. The Roman roads from Carthage were then traced, and reference was made to the remarkable natural harbour at Bizerta. The town of Thabraca and the castle of Charles V., on an island off the coast, were then mentioned, and a brief account given of the beautiful country of the Khomair tribes. The Roman road along the banks of the Bagradas were traced, and the remains of Bulla Regia, the residence of Numidian kings long before the Roman occupation, and of Simittu, with its magnificent marbles, were then referred to. Further eastward, along the banks of the same river, where the great aqueduct of Carthage, having a total length of sixty-one miles, crosses the plain, a full description of this stupendous work was given in detail, as well as a history of the development of the science of water supply in North Africa, and of the construction of cisterns in that country from the earliest times. The Roman road south of Carthage was then traced, and mention made of the ruins of Aphrodisium, and of the great city of Uthina. Journeying southward, the mountain of Zaghouan was reached, and a description given of the ruined temple, with its colonnades, which the Romans built over the spring that supplied water to Carthage. Reference was then made to the holy city of Kairouan or Kairwân, and to the Roman shafts and capitals that form the chief ornament of the Great Mosque.* Thysdrus, better known as El-Djem, was described, and a detailed historical account given of the great amphitheatre there, its materials, its mode of construction, and its size compared with other well-known examples. Turning northward to Carthage, the remains of towns on the south bank of the Bagradas were described, and especial reference to Thugga, remarkable for its numerous monuments as well as for the beauty of its position. Continuing along the Roman track, the site of Agbia was reached, where are the remains of an immense Byzantine fortress. Some account was then given of these strongholds in North Africa, and their development in the sixth century into Monasteria for soldier-monks. The walled enclosure at Tebessa in South Algeria was referred to as a striking example of this kind of building. Passing close to the fatal plain of Zama (where Hannibal was signally defeated), the great ruins of Assuras were described, as well as the remains of Sicca-Veneria, now known as El-Kef, signifying "the rock," occupying a remarkable position at a considerable elevation. The ruins of Mactar were then reached, and following the Roman road by Sufes, a town that once covered an area of nearly three square miles, but is now a mass of stones,—the last town on the western frontier, named Ammædara by the Romans, but better known by the modern name of Hydra, was described. The remains of Scillium were then referred to, and a full description given of the mausoleum of M. Flavius Secundus, with its quaint inscriptions. East of Scillium are the remains of Sufetula, the most important as well as the most interesting in Tunisia. These were fully described, special reference being made to the remarkable enclosure, commonly called the Hieron, on account of the three temples within the walls. Passing allusion was made to the sites of other towns farther south on the borders of the Desert that have not yet been explored, but no mention is made by travellers through this region of any architectural monuments now standing. The monuments of a country, such as those in North Africa, where written records fail, may be considered as so many pages of history, and the architect and the historian may walk, hand in hand, rebuilding the ruins, re-editing the fragments, and giving them their proper place and value in the records of the country. The principles of law and order were exemplified in Roman architecture in a remarkable degree, resulting in a national style that can be recognised in any of the monuments of the Roman Empire.

In the discussion which followed,

The Chairman expressed the pleasure with which he had listened to Mr. Graham's interesting, scholarly, and suggestive paper. It raised a great many subjects for discussion and question, and he hoped they would have some remarks from visitors present who were familiar with Tunisia.

Mr. H. S. Ashbee, F.S.A., said that perhaps there was no country in the world where we could better appreciate the power and grandeur of Rome than in North Africa, and especially in Tunisia,—not so much from the monuments that had been left, as from a comparison of the desolate and terrible state of the country at the present time with what it must have been in Roman times. That country, which then supported a vast population of its own, and which was, in addition, the granary of Europe, had now become a mere waste, scarcely affording food for its sparse population. In one of the vast plains, for instance, one travelled for miles without finding any population except a few nomads, and no agriculture or even a tree was to be seen, nor was there shelter of any kind. Yet they were told by the ancient Arab historians that when the site for a city was chosen there it was an impenetrable forest, infested with venomous serpents and wild beasts, and that the interposition of Allah was necessary to make those enemies of the human race retire. The vast cisterns or reservoirs to which Mr. Graham had referred were of undoubted Roman workmanship, as was shown by the niches to be found in the interior of some of them. Mahomet forbade the erection of statues, and those niches were doubtless intended for nymphs or other images, and had rounded arches, not the horseshoe ones of Arab construction. In the great plain in which Thysdrus stood there was the same absolute desolation; the ground was furrowed by neglected water-courses which had broken up the country in every direction, so that no one could pass for three miles in a straight line. The amphitheatre would never have been put up on the plain unless there had been a population there. Thysdrus was, no doubt, a minor place, but doubtless the whole plain was at one time covered with homesteads and villages, the well-to-do cultivators of which would fill the amphitheatre at the time of the games. For over a thousand years the Arabs held this beautiful country, which had a climate little short of perfection. They found it numerously populated by a cultured and active people, and adorned with magnificent monuments, the drawings of some of the remains of which were upon the screen. The Arabs drove out or slaughtered more people than the whole country now contained; they cut down the forests without replanting; and they neglected the rivers and water-courses, allowing the roads to disappear and the bridges to decay, and they let the land go out of cultivation. In short, they turned a fruitful country into a desert, a garden into a wilderness. When it was considered that they had left no literature worth speaking of, and no monuments of their own; that no development of science or of commerce was to be found, it was permitted to them to turn their thoughts from such a people back to those grand times when Rome was dominant in North Africa,—to the times when those magnificent monuments were erected, the drawings of which, thanks to the faithful and facile pencil of Mr. Graham, they were able to admire upon the walls.

Mr. F. W. Percival remarked that, having travelled over a large portion of the country described by Mr. Graham, he had listened with great interest to the paper. Tunis could be easily reached, and was an extremely interesting centre from many points of view. If the district were thoroughly examined, he believed that discoveries of great architectural interest would result.

Mr. R. W. Edis, F.S.A., Member of Council, proposed a vote of thanks to Mr. Graham for his exceedingly interesting paper. The subject was one in which they all took a very great amount of interest. He had no idea that there was so much Roman work in a part of the world which he had always believed consisted chiefly of sand.

Professor T. Roger Smith seconded the vote of thanks, and referred to the great excellence of the paper and its illustrations. It was only when one attempted to do anything of the sort that one understood how much pains and labour went to the creation of such illustrations. It was well that we should from time to time be reminded of the great debt we owed to the Romans, of whom we were architecturally the descendants. All the architecture of Europe, both Christian and Renaissance, traced back to a Roman origin, and when we found in a hitherto-unexplored country a fresh proof of the vigour and energy with which the Romans colonised, and the orderly manner in which they erected monuments and buildings of the highest importance, we could only feel that here was a great people whose mission it was to supply a kind of energetic stimulus, the results of which had remained to the present, and the influence of which would remain for many generations yet to come. Therefore, we were specially indebted to any one who showed us the works of those who were in a certain sense our forefathers, in the way Mr. Graham had done that evening.

The resolution was then put, and cordially received.

Mr. Graham, in replying, said it was a pleasing task to prepare a paper of this kind, which went a little out of the beaten track. It might be that some of them might think the information he had brought together could be found in that usual resort of the thirsty *littérateur*,—the encyclopædia. But in order to obtain reliable information on the subject he had not only traversed the country and seen many of the remains described, but had traced back all the statements he had made as far as he possibly could to the original Latin authors of the first, second, and third centuries. Under these circumstances they might fairly rely upon his statements,—not only those which he had read, but those which, for want of time, were left unread, but which he hoped many of them would peruse when the paper was published in its entirety in the Institute's "Transactions."

Rodney Stoke.—The parish church of Rodney Stoke, near Wells, Somerset, has just received some important and much-needed decorative additions to the chancel. An oak panelled and boarded ceiling, with richly-carved bosses and ornamental cornice has superseded a common lath-and-plaster ceiling. An entirely new east window, with handsome tracery, harmonising with the fifteenth-century architecture of the church has been added. It contains three lights, and is filled with painted glass, by Messrs. Lavers & Westlake. The architect is Mr. B. Edmund Ferrey, F.S.A. The window superseded was a very poor one, inserted about thirty years since.

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* Some particulars of this Mosque, by Mr. Herbert Carpenter will be found, in the *Builder* for Feb. 24, 1883, p. 237, and in the Institute "Transactions" for the same year.

COMPETITIONS.

The Fulham Vestry Hall.—A special meeting of the Fulham Vestry was held on Tuesday evening, the Rev. F. H. Fisher, M.A., in the chair, to consider the report of a committee stating that several letters were read from competitors *re* the Vestry Hall plans, pointing out the hardship they would be subjected to in consequence of the resolution of the Vestry deciding to adjudicate themselves on the plans, and recommending the rescinding of so much of the resolution relating to the non-appointment of a professional adviser to assist the Vestry in the examination of the amended plans for a Vestry Hall.—The adoption of the report was proposed by Mr. Hamer, and seconded by Admiral Sullivan.—Mr. Walden maintained that they were practical men, and quite competent to decide upon the plans.—Mr. Easton expressed an opinion that Mr. Currey made a mistake in his award. The Vestry had acted in a manner which he thought was for the benefit of the parish. He felt sure that the vestrymen were capable of forming an opinion as to the plans.—Mr. Cardwell said a professional adviser should be called in for the benefit of those vestrymen who were unable to form an opinion as to the plans. He regretted that Mr. Currey's award was not accepted.—Mr. Hamer thought the proposition to ask their surveyor to act as adviser would prove impracticable and undesirable. What was their object in appointing a professional adviser in the first instance? In order to obtain the best design, and, further, that they should have an independent man. He also regretted that the award was not accepted. They had set aside Mr. Currey's award, and, if they adopted the report, they would be excluding the best men of the profession from joining in the competition. Not having a professional adviser, they practically excluded members of the Institute. The best thing they could do was to obtain the advice of a man of equal standing to Mr. Currey. He hoped they would rescind the resolution, so as to enable members of the Institute to participate in the competition. The motion that the report be adopted was put to the meeting, and lost. (A letter referring to this subject appears on another page.)

Illustrations.

ST. JAMES'S (R.C.) CHURCH, SPANISH-PLACE.

WE publish this week two views of the design Mr. Leonard Stokes submitted in the recent competition for the above church. The drawing of the exterior is now in the Exhibition at the Royal Academy, and has been already noticed by us. The interior we criticised at the time of the competition. The plan is arranged so as to give as far as possible an uninterrupted view of the altar and pulpit, and a low triforium has been introduced in order to obtain as much accommodation as possible on a somewhat cramped site. The materials proposed were red brick and stone throughout both the interior and exterior.

THE NEW HOMŒOPATHIC HOSPITAL, LIVERPOOL.

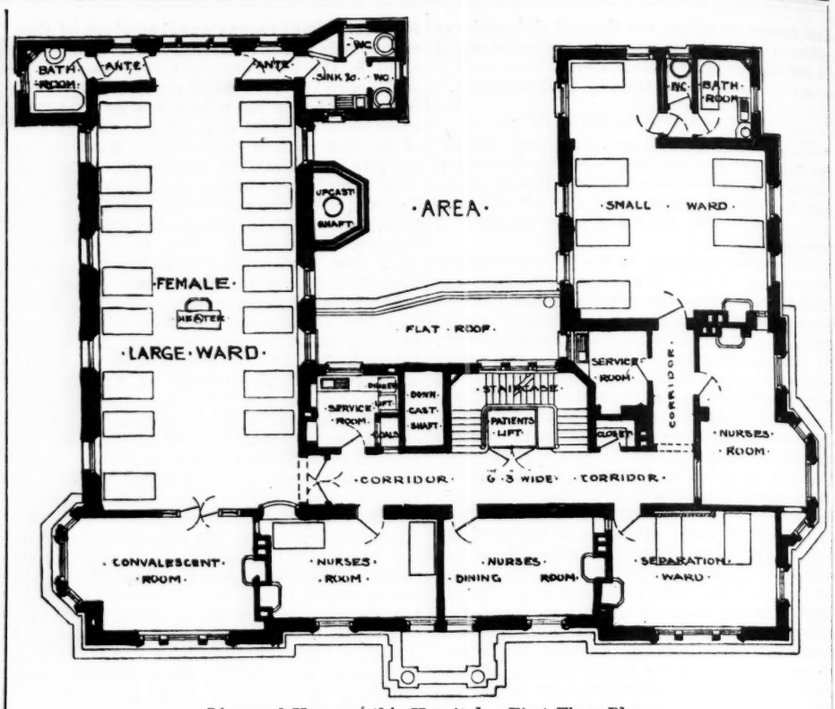
THIS building, of which we give an illustration this week, occupies a prominent site at the corner of Hope-street and Hope-place, Liverpool. The illustration shows the exterior from the north-east angle.

The building is designed to accommodate fifty beds at present, and is capable of being enlarged, on the south and west sides, so as to provide twenty or thirty more.

The basement is arranged as a dispensary, to take the place of the present one in Hardman-street.

The building is upon the red sandstone rock, and stands high in what is considered to be the healthiest part of the city.

The wards are arranged to have a southern aspect, and in the case of the three larger ones, cross lights, and large windows at the west ends. The large wards (male and female) on the first and second floors are 69 ft. by 24 ft., and have each a convalescent-room, with large bay window at the east end. A smaller ward is provided on the first floor, and two infectious wards, completely isolated from the rest of the building, on the second floor. Two separation wards are arranged on the first and second floor; and five private wards, with a convalescent-room on the third floor, all being lofty and well lighted. Service-rooms, with hot plates, sinks, dinner-lifts, &c., are placed next the wards, and nurses' rooms, with inspection-openings commanding all the beds. The latrines and bathrooms at the ends of the wards are completely cut off by an air-space and double doors from the wards adjoining; they have a separate system of warming and ventilation, and will be lined throughout with glazed tiles, and have polished cement floors.



Liverpool Homœopathic Hospital.—First Floor Plan.

Nurses' bedrooms, and dining-rooms, an operating-room with north and top light, servants' bedrooms, &c., occupy the remainder of the upper floors.

The main staircase is of granolithic stone; and the whole of the corridors are of fireproof materials.

On the ground-floor are the kitchens, sculleries, larders, stores, servants' hall, pantry, and service-room, in the south wing. The board-room, stores, office, porter's room, boys' room, and entrance-hall, are to the front. The House-Surgeon's sitting and bed room and spare room; the matron's sitting and bed room, bath-room, &c., and large store, with hoisting doors to yard, in north wing.

A hydraulic lift for patients will be provided from the ground to the third floor, in the well-hole of the stair; and a coal-lift from the basement to the top of the building.

With the exception of a large store-room, the wine and beer cellars, and the mortuary, the whole of the basement floor is devoted to the dispensary requirements. A large waiting-hall, with latrines at the west end, is provided, with porter's room overlooking it, and communicating with a spacious corridor, off which are seven well-lighted consulting-rooms, a waiting-room, with dispensing-room and exit door, completes the arrangement of this floor. Dados of glazed brick are provided in the hall and corridors.

The sub-basement is devoted to the heating-chamber, coal-places, air-shafts, and chambers of the heating and ventilating apparatus.

The exterior of the main front is faced with red Ruabon brick, the strings, cornices, window dressings, &c., of stone from Stourton quarries. The ridges, hips, and finials are of terra-cotta, and the roofs are covered with Welsh slates. The drainage of the building has received special attention, and the soil drain-pipes will be flushed out by means of a large self-flushing tank (Bowes Scott & Reid's patent) placed at a point where the soil-pipes from the closets join the drain. The ventilation and warming are arranged on the "self-acting suction power" principle, as successfully applied by Drs. Drysdale and Hayward, of Liverpool, to several dwelling-houses in the neighbourhood, and may be briefly described as follows:—The foul air is extracted from all wards and rooms by flues situated near the ceilings, carried up through the walls to a horizontal foul-air chamber in the roof. This chamber is intended to cause all the foul-air flues joining it to be drawn on equally by the central downcast shaft, with which it is connected, and which conveys the foul air to the bottom of the great upcast-shaft, which actuated the whole system, and is then carried up the same, rising some distance above the ridge of the roof, and finished with an iron hood, having side openings for the escape of foul air. The centre of this shaft is occupied by an iron flue from the kitchen fireplace and heating apparatus boiler, and also connected with a large Cockle stove for use when the boiler is not required.

By this means a powerful current will be induced in the upcast and consequently in the downcast shaft and its connecting system of foul-air chambers and flues. Regulating valves will be fixed at both the upper and lower ends of the foul-air flues to admit of them being accurately adjusted. Central fireplaces are provided in the large wards, if iron and earthenware, with separate air supplies, water-trays, marble tops, &c.

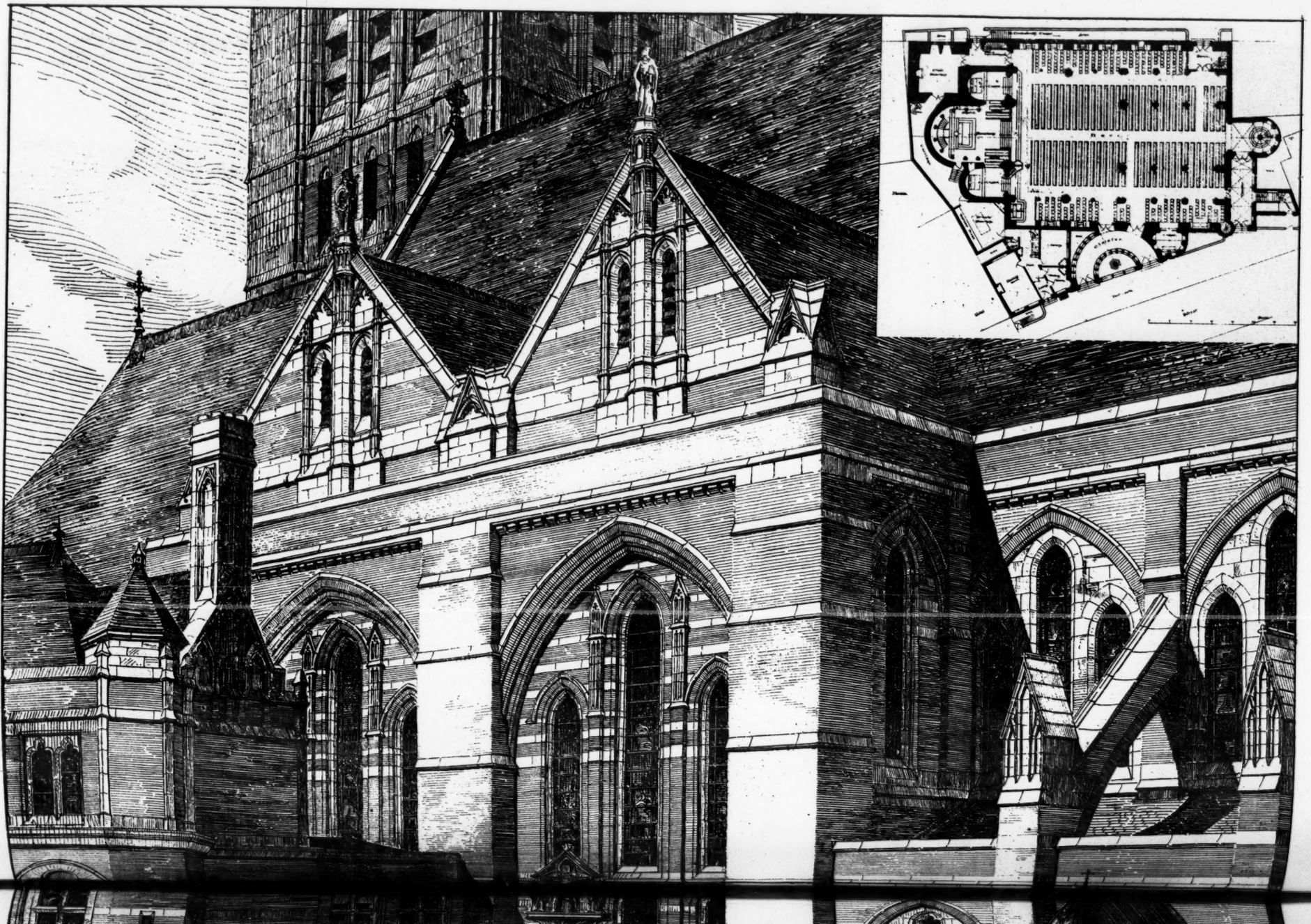
The fresh air is introduced into the various rooms and wards, &c., by means of flues in the walls, connected at their lower ends with a chamber heated by rows of hot-water pipes and running round the whole of the building under basement floor. A perforated wall allows the fresh air from an adjoining air-chamber to pass over the hot-water pipes so as to enter the various rooms at a temperature of 60 deg. in the coldest weather.

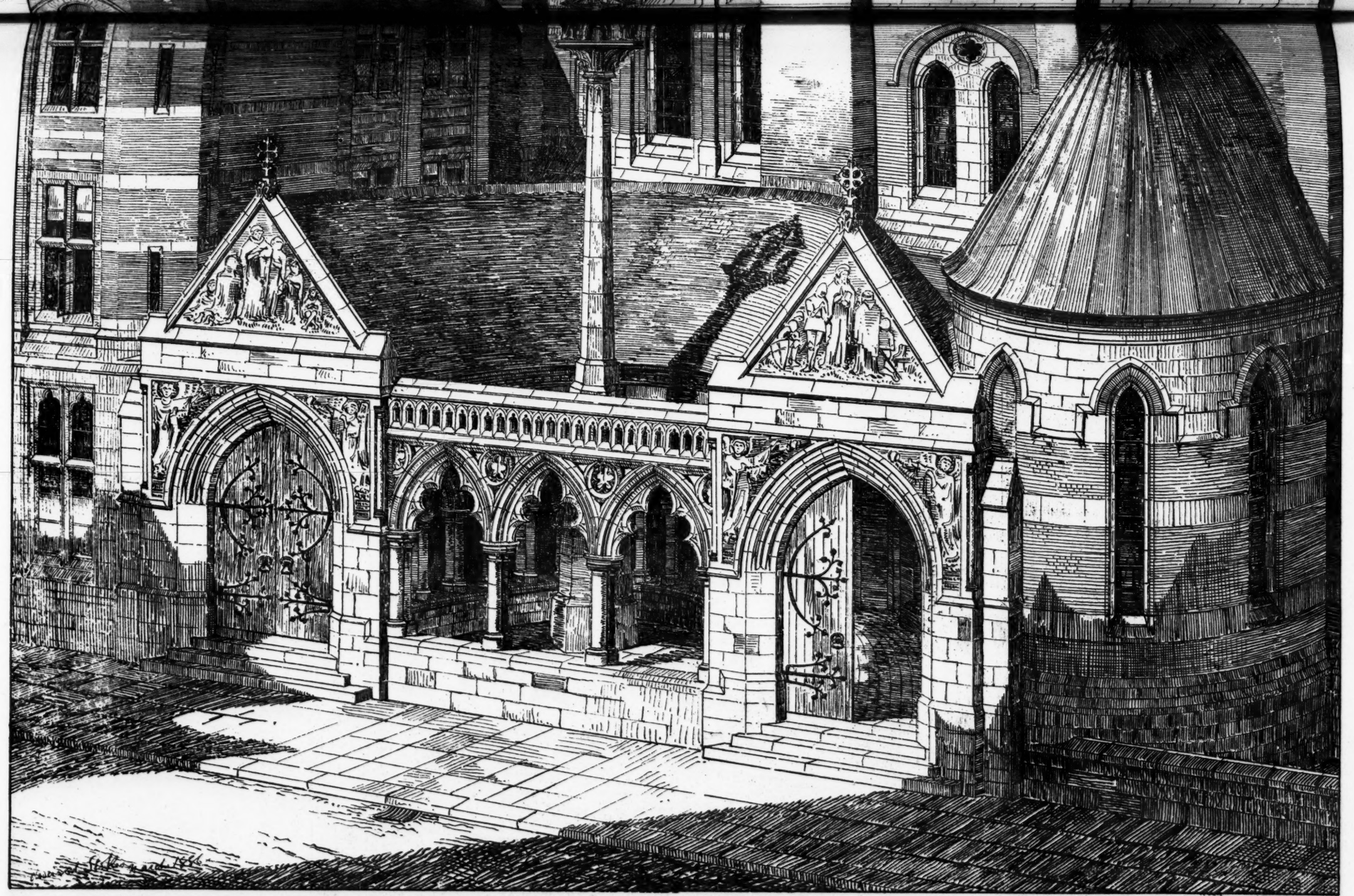
Fresh air is supplied to the air-chamber by means of seven "Æolus Water-spray Inlet Ventilators," which suck the air from some height above the ground.

By means of these appliances and the regulating valves at the upper ends of the fresh-air flues, the supply of heated or cold fresh air can be regulated with the greatest nicety, or shut off from wards not in use.

The hospital, the first contract for which amounts to over 13,000*l.*, is being erected at the sole cost of Mr. Henry Tate, of Park Hill, Streatham, and Liverpool, on the freehold site recently purchased by him from the Liverpool Corporation.

The contractors are Messrs. Holme & Green, and the architects Messrs. J. & G. Holme, of Liverpool. Mr. W. Bell is clerk of works.



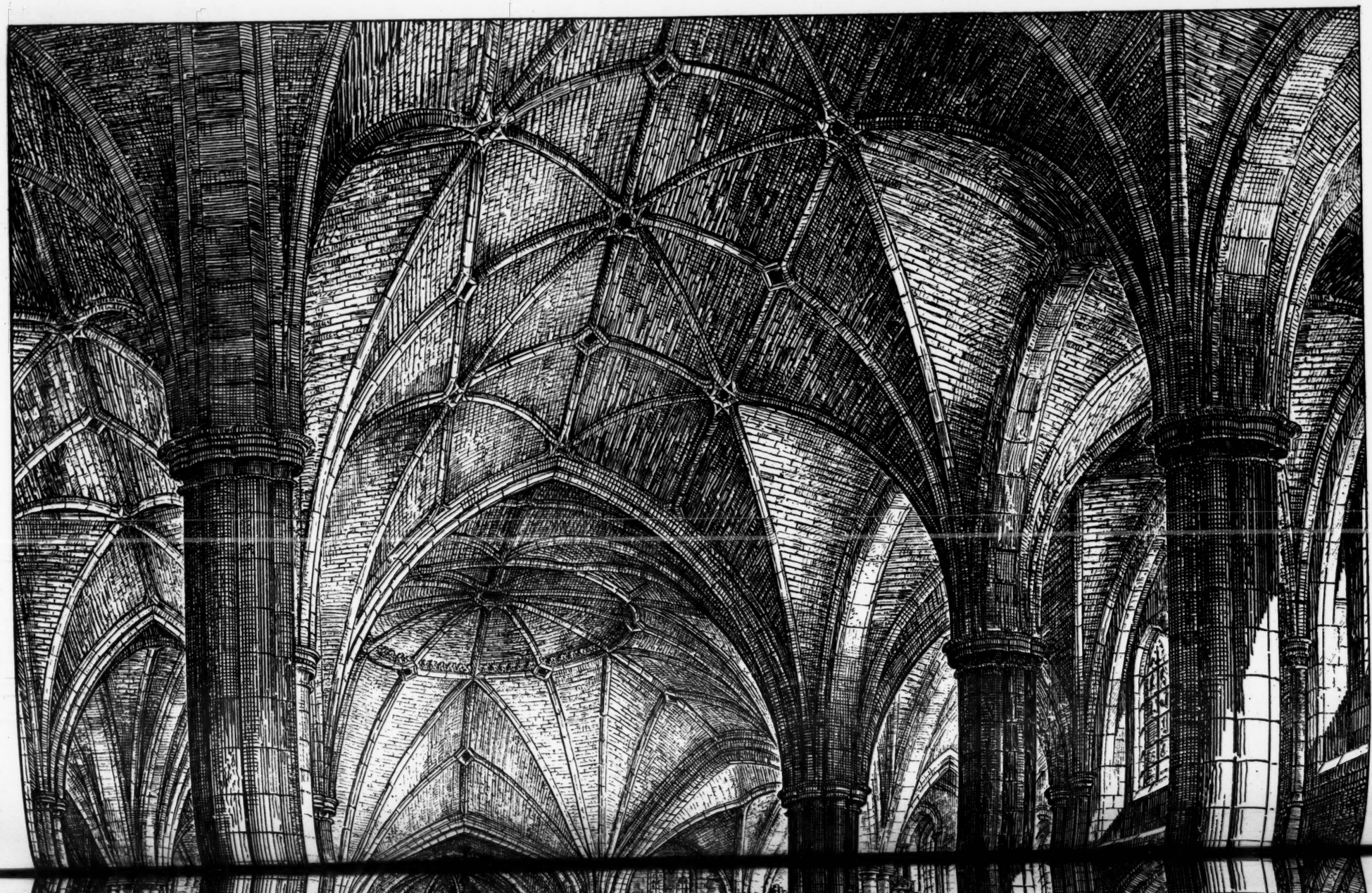


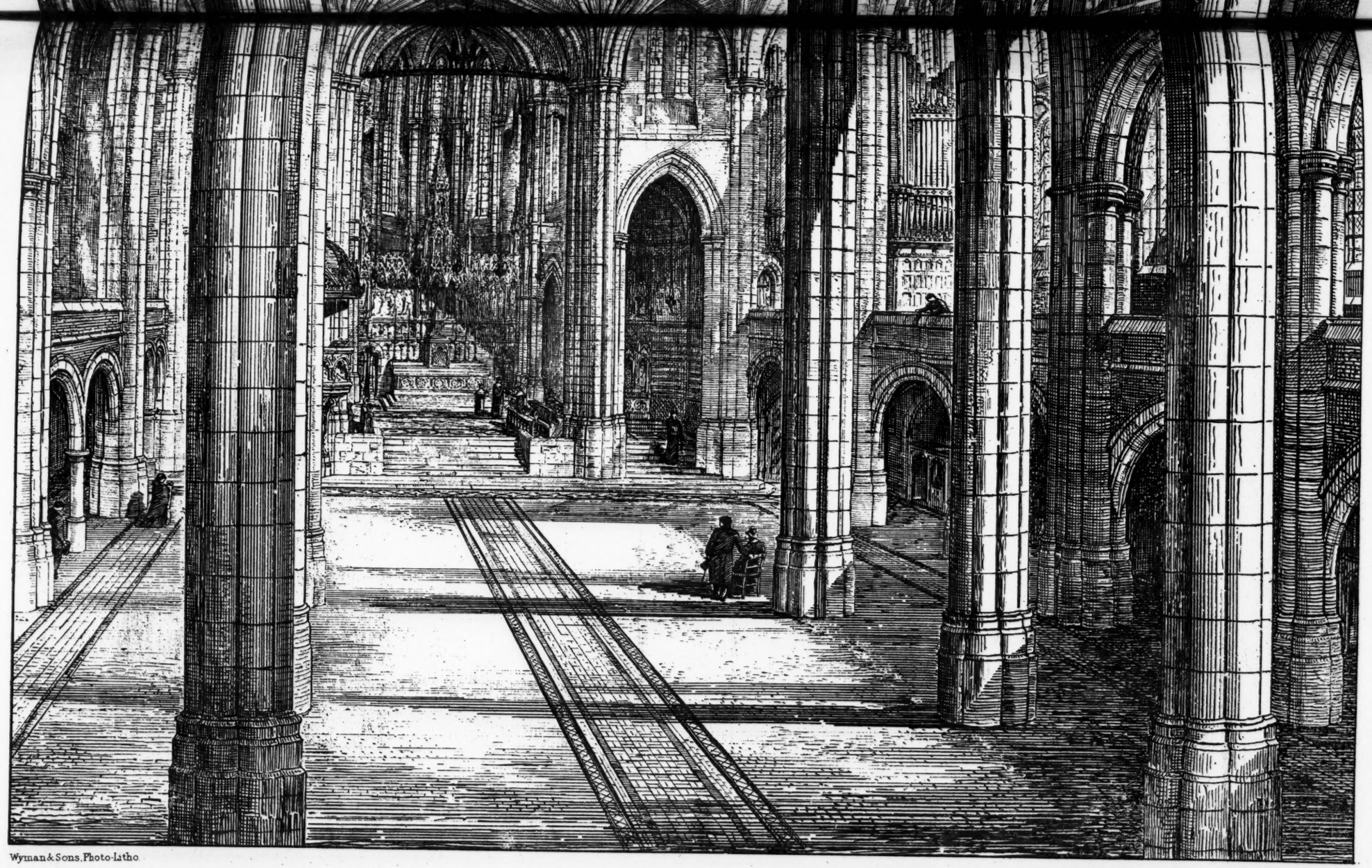
Wyman & Sons. Photo Litho

C^t Queen S^t London. W.C.

COMPETITION DESIGN FOR THE NEW CHURCH OF ST. JAMES, SPANISH PLACE: SOUTH TRANSEPT AND PORCH.

MR. LEONARD A. S. STOKES, A.R.I.B.A., ARCHITECT.



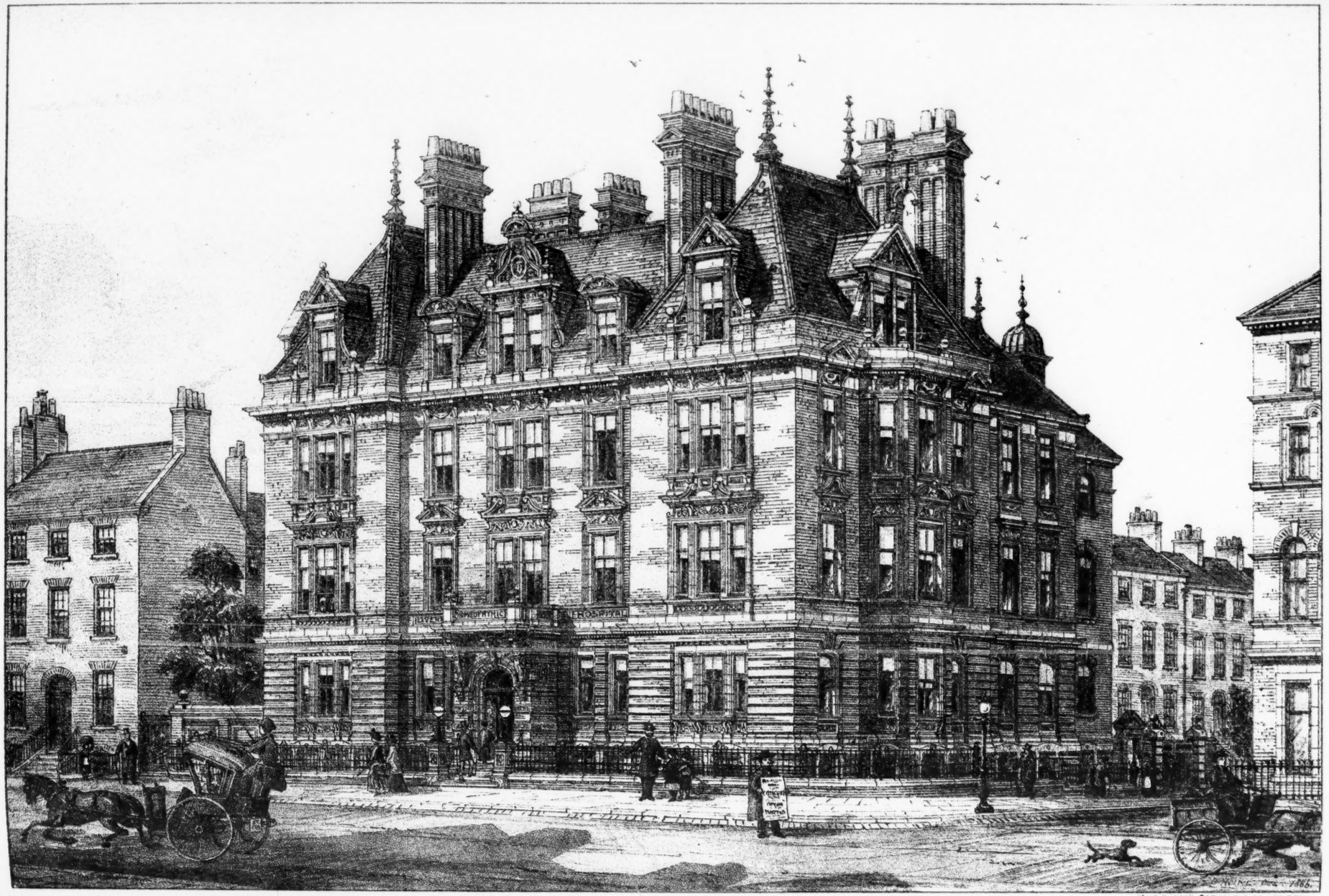


Wyman & Sons, Photo-Litho.

C^t Queen S^t London, W.C.

COMPETITION DESIGN FOR THE NEW CHURCH OF ST. JAMES, SPANISH PLACE: INTERIOR, LOOKING EAST.

MR. LEONARD A. S. STOKES, A.R.I.B.A., ARCHITECT.

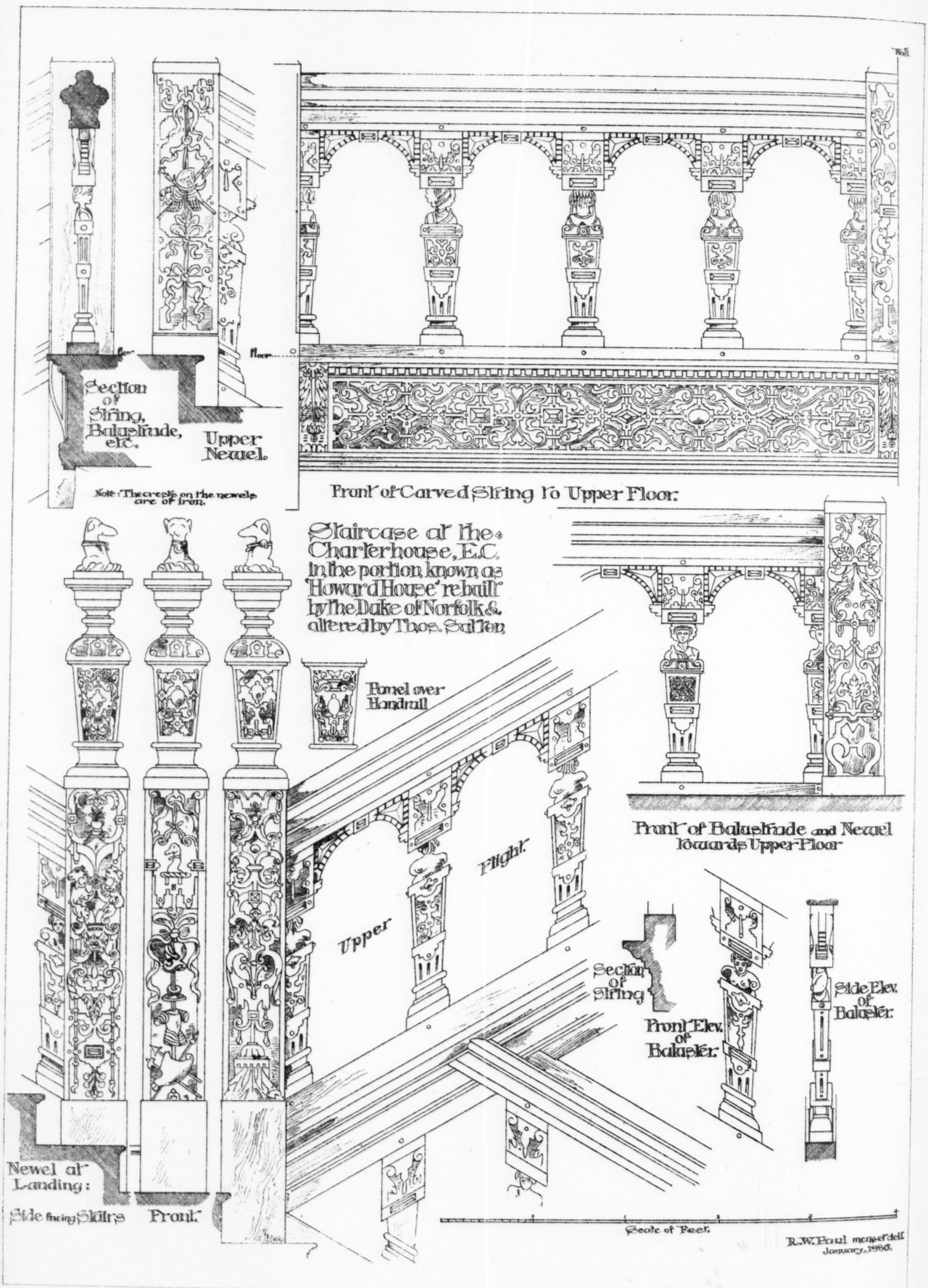


INK PHOTO. SPRAGUE & Co. LONDON

THE NEW HOMŒOPATHIC HOSPITAL, LIVERPOOL.—Messrs. F. and G. Holme, Architects.

"INK PHOTO" SPRAGUE & Co. 22, MARTINS LANE, CANNON ST, LONDON, E.C.

ST. BRIDE'S VICARAGE.—Mr. Basil Champneys, Architect.


No 1.
Section of String, Balustrade, etc.
Upper Newel.
Floor
Note: The cresting on the newels are of iron.
Front of Carved String to Upper Floor.
Staircase at the Charterhouse, E.C. in the portion known as "Howard House" rebuilt by the Duke of Norfolk &. altered by Thos. Sutton.
Panel over Handrail
Front of Balustrade and Newel towards Upper Floor
Upper Flight.
Section of String
Front Elev. of Baluster.
Side Elev. of Baluster.
Newel at Landing:
Side facing Stairs
Front.
Scale of Feet.
R.W. Paul, memb. of Soc. January, 1886.

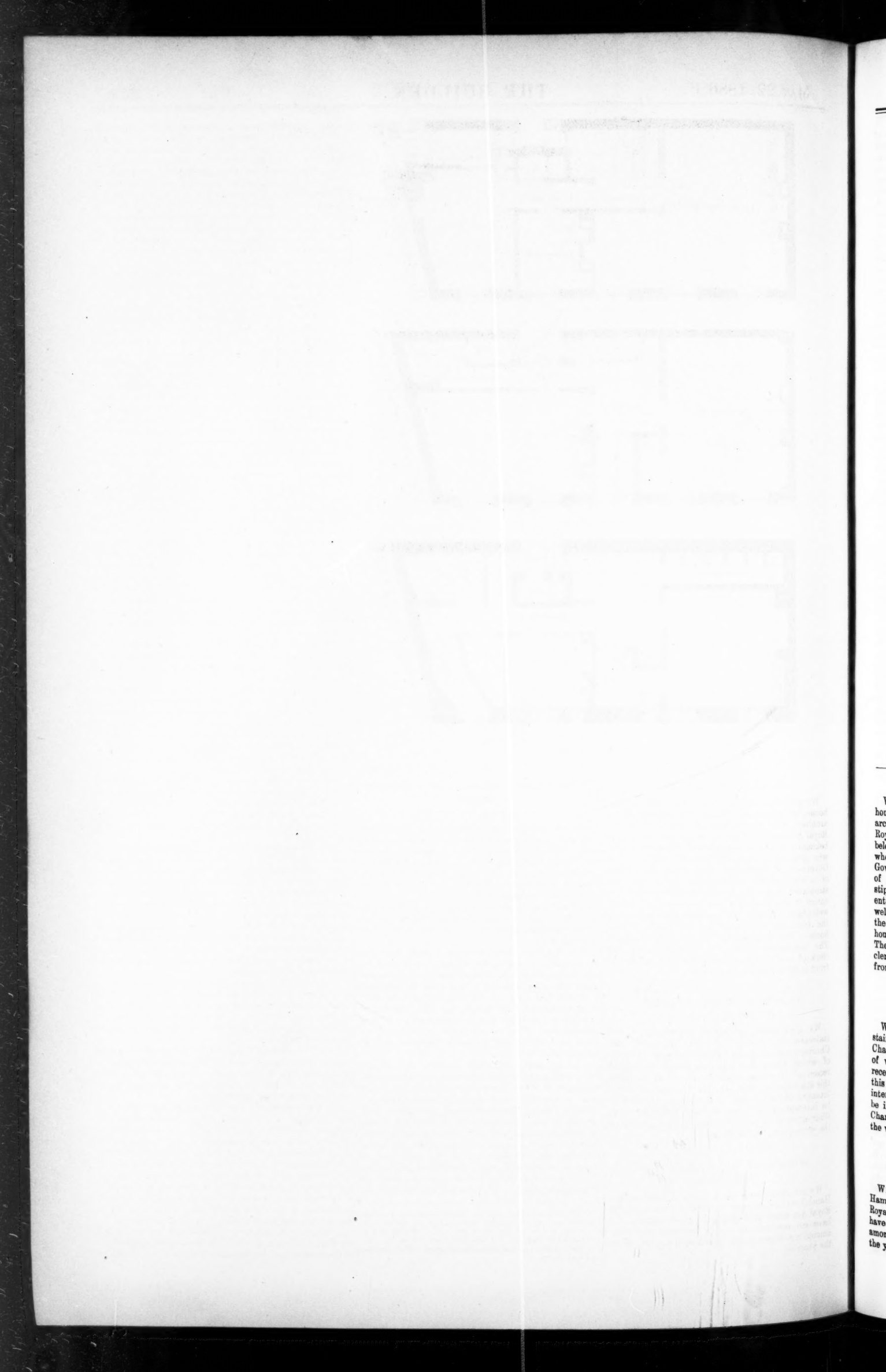
"PHOTO-LITHO" SPRAGUE & Co., 22, MARTINS LANE, CANNON ST., LONDON, E.C.

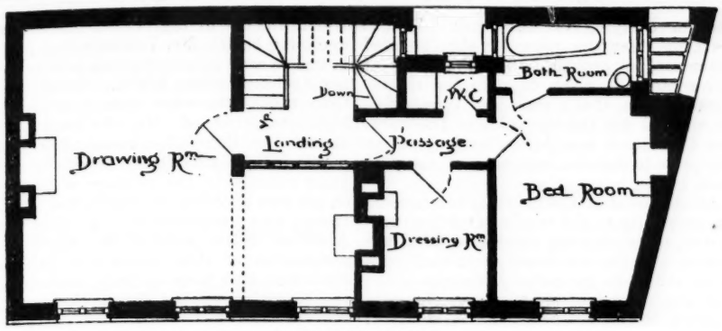
SOME WOODWORK AT THE CHARTERHOUSE.

PHOTO-LITHO SPRAGUE & Co. LONDON

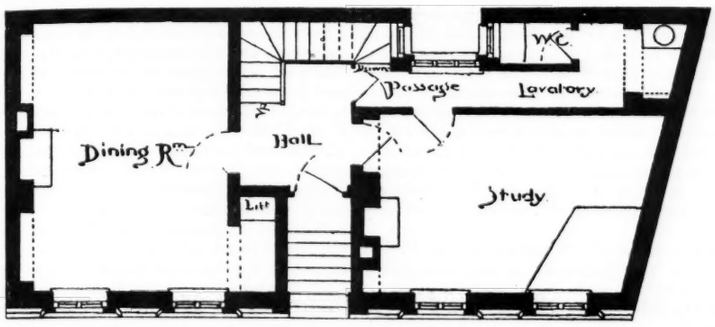
THE SOWER.—MR. HAMO THORNYCROFT, A.R.A., SCULPTOR.

(From a Sketch by the Artist.)

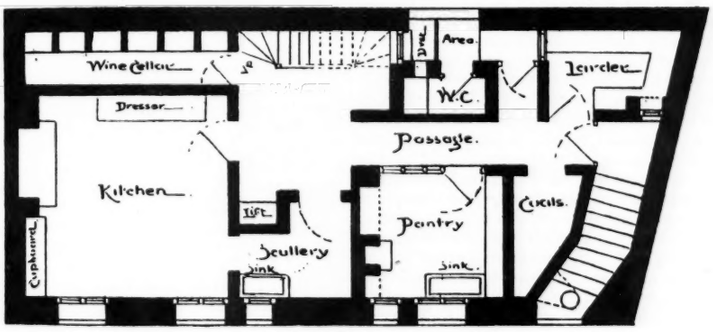




FIRST FLOOR PLAN.



GROUND PLAN.



BASEMENT PLAN.

St. Bride's Vicarage.

ST. BRIDE'S VICARAGE.

WE publish to-day a view of this new London house, of which Mr. Basil Champneys is the architect, and a drawing of which is in the Royal Academy. The house is built on ground belonging to the Ecclesiastical Commissioners, who granted a site of 1,000 ft. super. The Governors of Bridewell, who were the owners of a wall which commanded light and air, stipulated that the house should occupy the entire frontage at the northern end of Bride-well-place. Hence the considerable extent of the frontage compared to the depth of the house. The material is red brick throughout. The contractor was Mr. Nightingale; the clerk of works, Mr. Goodchild; the railing in front is by Mr. Richard Crittall.

OLD WOODWORK AT THE CHARTERHOUSE.

WE give some measured drawings of the staircase in Howard House, part of the Charterhouse property, about the possible fate of which there has been so much discussion recently. The portion of the building in which this staircase is, was not, we are assured, ever intended to be touched or removed; but it may be interesting to those who do not know the Charterhouse interior to have this example of the work to be found there.

SCULPTURE AT THE ROYAL ACADEMY.

WE give this week a sketch by the artist, Mr. Hamo Thornycroft, of his principal work at the Royal Academy this year, "The Sower." We have commented on it in another column, among remarks on the Academy sculpture of the year.

THE RECENT MUNICIPAL WORKS IN ROME.

SURVEYORS' INSTITUTION.

AT the ordinary general meeting of the Surveyors' Institution, held on Monday evening last, Mr. F. Vigers (Vice-President) in the chair, the President (Mr. E. I'Anson *) read an interesting paper on "The Recent Municipal Works in Rome." We are permitted to extract some portions of it:—

Of all the cities of Europe,—may I not say of the world?—there is none which excites more interest than the City of Rome, the Eternal City.

For the last three winters I have had the opportunity of seeing the extensive works which are in progress; it is these municipal works and their initiation which I now propose to describe.

When the seat of the Government in 1870 was transferred to Rome, the city was found insufficient to fulfil the requirements of its new destination. The considerable increase of its fixed population and probable increase had to be provided for.

The necessity that the modern city should have well-planned and well-drained streets, the example of what Florence, which for five years was the seat of Government, had already accomplished, immediately engaged attention, and, whilst it was felt desirable to initiate works of urgent necessity without delay, it was equally felt that some general plan should be settled to regulate the development of the city, with a view to which, within ten days after the formation of a provisional government on the 30th of September, 1870, a Commission was appointed, of which Signor Pietro Campanesi was President, the veteran archæologist, Signor Rosa, was vice-president, with nine other members, architects or engineers, all Romans, and well acquainted with the topography, the local difficulties, and the many questions which had to be considered in designing a plan for the development of the city.

This Commission, although the members were soon agreed on the general principles of a plan, did not so easily agree as to the details of the extensive and complete scheme they were appointed to carry out.

When the Commission commenced its labour the members had before them plans which had already been prepared, namely, a *piano regolatore de Massima*; a second plan, proceeding from a section of the appointed Commission; a third plan, presented by the Roman Communes, prepared by the engineer Merotte; and a fourth plan, by an architect named Paniconi.

A Council of the Roman Commune was called on to deliberate on these plans on the 3rd of June, 1871; they appointed four engineers to examine and report on the merits of the plans produced, who reported in favour of the plan of the Government Commission, but suggested various alterations, whereupon an amended *piano regolatore* was prepared.

At this stage of the inquiry another engineer, Alessandro Viviani, was called in, when, after the lapse of several months, the *piano di Massima* was recommended for adoption, and provisionally approved by the Council on the 28th of November, 1871, when, pursuant to a law passed in 1865, the plan was publicly exhibited, so that it might be fully known and criticised; and on fifteen consecutive days this plan was examined by a daily average of 120 persons, in all about 1,800. The objections made were neither serious nor numerous, but all objections made, either by individuals or by the public press, were carefully recorded, so that any amelioration to the plan which might appear necessary as the result of the objections offered could be made.

This plan seems to have been divided into sections, for on the 14th of September, 1871, the Council approved of the plan for the Esquiline Quarter.

The Commune, on the 13th of November, approved of the plan for alterations in the Piazza Sta. Maria Maggiore and adjacent streets; on the 20th of February, 1872, of the plans of the Pretorian Camp and of the Viminale Quarter; on the 20th of March, of the Industrial Quarter of Testaceo; and on the 6th of April, of the Quarter of the Celio.

Finally, at the sitting of the 19th of August, 1872, the project was approved of continuing the Via Nationale direct to the Fountain of Trevi and to the Piazza Sciarra, and for which the necessary powers of expropriation were obtained.

The Commission had proceeded thus far in the summer of 1873, by which time the Massima plan, which was then partially approved, contained all the fundamental requirements of a first design, and it was again presented for the sanction of the Council, who, before having a definitive consultation, on the 9th of July, 1873, appointed a third Commission composed of four engineers, with instructions to re-examine the plan and also ten other plans, which by that time private engineers had laid before the Municipal Administration.

Two months afterwards this Commission published their Report, dated the 3rd of September, 1873, which determined that neither of the ten new plans was better than the official *piano regolatore*, or capable of being combined with it.

The Commission classed the proposed works under three categories:—1. Those they thought indispensable. 2. Those they thought relatively useful. 3. Those they considered ornamental and not absolutely necessary.

On this report further discussion took place, the opinion of the public was invited, and several meetings took place to consider the objections and criticisms on the plans, which were read to the Council on the 6th of October, 1873, Franesco Nobili Villetasche, President: and on the 18th of the same month the *piano regolatore* appears to have been accepted, and a further commission was then named, who published it in April, 1882, and this seems to have been the final Report. It was signed by Villetasche, President; Marco Ottoboni Duca de Tiano, Giovan Ballista de Rosa (the veteran archæologist), Salvatore Bianchi, Emidio

* It is worth remark that Mr. I'Anson at present enjoys the dual and unique honours attaching to his positions as at once President of the Royal Institute of British Architects and President of the Institution of Surveyors,—the two leading professional societies connected with architects and surveyors.

Renazzi, Andrea Brachi, Geatano Pompiano, and Antonio del Vecchio, Secretary.

The *piano regolatore*, after passing through the various Commissions which had succeeded each other, received the approval of the Parliament, when a law was passed to enable the State to contribute to the rebuilding and extension of what had become the capital town of the country.

So early as 1873 it had become apparent that without the assistance of Government the city had not the power to meet the exigencies of the new position, and that it was not reasonable that the Commune of Rome should without assistance be required to provide for the expense of the proposed works, which were for the advantage of the whole nation. Nevertheless it was even then decided to continue the works in the new Esquiline Quarter with the Via Nationale, delaying other works for the time, and until Government assistance could be procured.

The Committee found, by reference to the statistics of the decennial period anterior to 1871, that the annual increment of the population had been 3,000; from 1871 to 1881 the increment had been 80,000, perhaps one-half of which was occasioned by transporting the seat of Government to Rome. In 1879 the increase was 7,100; in 1880, 9,000; in 1881, 6,500; and it was considered that, during the next twenty-five years, the annual augmentation might be reckoned at 5,000, or in all 125,000, which, added to the 300,000, the population at the time of the last census, would amount to a population of 425,000. Then, taking it as a basis that a well-arranged city contains 500 inhabitants to the square acre, including buildings and streets, the extension of the plan should be such as to provide for 850 square acres; and, as the inhabited part of the city in 1871 covered an area of 500 acres, it followed that the additional area required in the new quarter was 350 acres.

Additional spaces, conveniently placed, were also considered necessary for dock, markets, slaughter-houses, and above all for studios, workshops, and other buildings in connexion with the fine arts, one of the staple industries of Rome. The principal streets, it was determined, should be 25 mètres wide, and the others should vary from 20 to 12 mètres. It was more difficult to decide about the enlargement of the old streets on account of the difficulty of removing various old buildings of archæological interest and artistic value which it was desirable to preserve. It was considered that the bridges should not be more than 300 to 400 mètres apart, and that they should coincide with important streets already formed or contemplated, and the retention of gardens and public promenades, the committee considered, should not be neglected.

After making these general observations the Commission refers in considerable detail to various parts of the plan.

What may be gathered from this relation is, that vigorous efforts were made as soon as Rome became the seat of Government in 1870 to devise a plan for forming new streets and altering old ones, so as to effectually provide for the anticipated increase of population and the public buildings necessary for State and municipal purposes. The relation states that in 1865 a law had been passed to enable the compulsory acquisition of land and houses for purposes of public utility. It sets forth the various steps which were taken, the apparently thorough and conscientious study and publicity which was given to the subject, and concludes with recommendations as to the order of time in which the various works contemplated should be carried out.

The conception of the plan appears to me truly magnificent and of great public utility, because it is a *piano regolatore*,—that is, a plan which, after the largest opportunity for inquiry has been given, is the plan adopted by the governing body, the strict adhesion to which will ensure the development of a great and well-arranged city.

As I understand it, the Government takes the initiative, and requires the Commune to execute such works as the Government thinks necessary, leaving, however, as I gather from the relation, great latitude to the Commune as to the details; that thereupon the Commune studies the subject, and prepares its scheme and plan, and the approval of this plan is considered equivalent to a declaration of public utility, on which may follow the expropriation or acquisition of such property as may be required for carrying on the work. It also appears that after the plan for the intended improvements, or probably after the order of the Government is given to take the matter into consideration, that a period of twenty-five years is allowed for the execution of the work, and the Commune has power to levy taxes so as to provide for the expenses of carrying them out.

The development of the new city commenced in close proximity to the terminus of the railway, which, after skirting the east side of the city, enters it on the north-east, near the Porta Maggiore. Close to the railway station are the ruins of the Baths of Diocletian. Opposite these ruins a fine crescent has been formed, and from the centre of this crescent the important Via Nationale has now been constructed, running in a south-westerly direction for nearly 1,000 yards towards the Piazza Venetia, which is at the southern end of the Corso, the great street of old Rome. This is a noble street; it falls pretty gradually towards the Piazza Venetia until at the lower end, where the street has an inconveniently steep gradient, and an awkward bend. At the present time the work of the demolition of the buildings which it is necessary to remove in order to extend the Via Nationale towards the Castle of St. Angelo is actively going on.

From the Baths of Diocletian to the Piazza Venetia the Via Nationale is now completely formed, lined on both sides with either new buildings (entirely so in the upper part) or with old buildings in the lower part of the street, the façades or enclosures to which have been altered so as to adapt them to the line of the new street. Some gardens also abut on the street, causing open spaces to be left; but the aspect of the street is on the whole highly satisfactory, and in parts even picturesque.

In the upper part is one of the large modern hotels of Rome, the Quirinale, not far off from which, in a parallel street, is another modern hotel, the Costanze. On the upper part of the Via Nationale stands a charmingly-designed church, built for the Americans,—who frequent Rome in large numbers,—by the late Mr. Street, in the Mediæval style, with such modifications as the locality and the climate suggested to the mind of that most able architect. In the lower part of the street is a somewhat imposing building, called the Palazzo degli Belle Arti; the other buildings are private houses or shops. The street is of ample width, and planted as a boulevard, with trees on either side.

Not the least interesting work now in course of execution is the embankment of the Tiber, which is being carried on on the Trastevere side, in the prosecution of which scheme the embankment has been or will be advanced, and in one part the land at the back of the Palazza Farnesina, which projected into the stream, and narrowed it very inconveniently, has been removed. This work appears to be going on with considerable rapidity, and when completed will be a most important work.

THE SUPERINTENDING ARCHITECT:

METROPOLITAN BOARD OF WORKS.

AT the meeting of the Metropolitan Board of Works on the 14th inst., the Clerk, Mr. J. E. Wakefield, read the following letter:—

"Metropolitan Board of Works,
Spring-gardens,
May 10, 1886.

To the Chairman and Members of the Metropolitan Board of Works.

GENTLEMEN,—I beg to inform you that I find myself compelled by failing health to tender my resignation of the position of Superintending Architect to the Board, which I have held for more than twenty-five years.

It is with great reluctance and deep feelings of regret that I have resolved to withdraw from this high and honourable position, and from the performance of professional duties in which I have taken a very lively interest for nearly half a century (having entered my profession in July, 1836).

In closing my long connexion with the Board, I trust I may be allowed to express my grateful sense of the kindness and consideration which has always been extended to me by all the Members of the Board, the Chairman, and officers, the recollection of which will ever be a great comfort and consolation to me in my declining years.

In tendering my resignation I desire at the same time to say that I shall be prepared to continue the conduct of the business of the Department until the Board shall have made such arrangements as they may think necessary in consequence of my retirement, and shall also be willing and ready to place my services at the disposal of the Board on all occasions when the Board may think fit to honour me with their confidence.—I have the honour to be, Gentlemen, yours very faithfully,

GEORGE VULLIAMY."

Mr. F. H. Fowler said he was sure that he expressed the unanimous feeling of the Board, which was one of regret that in consequence of declining health Mr. Vulliamy had felt himself bound to send in his resignation as Superintending Architect to the Board. No one knew more than those who were connected with him the high character of Mr. Vulliamy. He had served the Board for twenty-five years. A pupil of Sir Charles Barry, and for some sixteen years engaged in the practice of his profession on his own account, he was elected from among twenty-two competitors as Superintending Architect in the place of Mr. Marrable on the resignation of that gentleman in 1861, and since then had been actively concerned, under the direction of the Board, in carrying out some of the most important street improvements which the metropolis had witnessed, and in his retirement he would carry with him the respect and esteem of every member of the Board with whom he had been associated. He moved, in the first instance, that Mr. Vulliamy's letter of resignation be referred to the Works and General Purposes Committee.

Mr. Freeman said that, as the oldest member of the Board, he was able to endorse to the full all that had been said by Mr. Fowler as to the regret which the Board would feel at Mr. Vulliamy's retirement. He seconded the motion, which was unanimously agreed to.

Mr. Vulliamy some time afterwards entered the Board-room, and presented his usual weekly report on applications under the Building Acts.

At the meeting of the Board to be held this Friday, the 21st, the Works and General Purposes Committee will present a report recommending that Mr. Vulliamy's resignation be accepted as from the 29th of September next.

It may be mentioned that Mr. Frederick Marrable, the first Superintending Architect to the Board, was elected on Feb. 4, 1856, when there were fifteen other candidates, viz., Messrs. W. Hosking, E. W. Lower, J. Blore, J. H. Taylor, G. L. Taylor, G. Legg, H. Harrison, J. T. Wood, C. W. Pined, Thomas Taylor, John Barnett, E. C. Hakewill, William Young, F. W. Stent, and S. C. Gant. At the last moment, however, Mr. G. L. Taylor wrote withdrawing his candidature, as he considered the salary offered for the duties too small. A member of the Board moved that the appointment should be deferred, and the question of salary reconsidered, but this proposition was negatived, and the election was proceeded with. Four of the candidates (viz., Professor Hosking, Mr. Marrable, Mr. Hakewill, and Mr. Barnett) were first selected by show of hands to go to the final vote, and ultimately Mr. Marrable was elected.*

Mr. Marrable resigned in 1861 under the following circumstances:—The Covent Garden Approach and Streets Committee presented a report to the meeting of the Board held on Feb. 9 of that year, recommending that the salary of the Superintending Architect be increased from 800*l.* to 1,200*l.* per annum, but to this recommendation an amendment was moved, and carried by twenty-seven to nine, that Mr. Marrable's salary be increased to 1,000*l.*† At the following meeting of the Board, Mr. Marrable sent in his resignation, on the ground that when, in 1856, candidates were invited for the office at a salary of 800*l.* per annum, nothing was said to induce a belief that he would be expected to perform such onerous and responsible services of a professional character as had been demanded of him, relating to the survey, valuation, and purchase of property for the new streets undertaken by the Board, and he regarded the increase of salary now offered as inadequate. The resignation was accepted, and it was referred to a committee to consider the duties and salary of the office.‡

At the meeting of the Board on March 15, 1861, Mr. Vulliamy was elected by thirty-two votes as against twenty-nine given for the late Mr. Sancton Wood, twenty-seven for Mr. R. Kerr, twenty-six for Mr. Isaacs, twenty-six for Mr. J. Billing, and twenty-three for Mr. C. Fowler. There were seventeen other candidates, viz., Messrs. Saunders, J. Young, F. R. Wilson, Hart, C. Eales, Salter, H. B. Richardson, Liddiard, T. Goodchild, T. Morris, Blore, Dixon, T. D. Barry, Cooper, J. Hansom, Kirkland, and Salmon.§

In February, 1877, the Board determined to elect an Assistant Architect and Surveyor, at

* *Vide Builder*, 1856, p. 78.
† *Builder*, 1861, p. 106. ‡ *Ibid.*, p. 130. § *Ibid.*, p. 195.

a salary of 500*l.* per annum, and it was remitted to the Works and General Purposes Committee to select six candidates from among those who applied for the appointment. There were only eight applications. The committee submitted the following names:—Messrs. D. R. Dale, W. Fogerty, John Hebb, George McDonell, W. Hilton Nash, and Jasper Wager. Mr. Hebb was elected,* and continues to hold the office.

ARCHITECTURAL SOCIETIES.

Edinburgh Architectural Association.—The annual general meeting of this Association was held on the 13th inst., Mr. Geo. Washington Browne, President, in the chair. Mr. J. Fairbairn, Hon. Secretary, read the report of the twenty-eighth session, which the Council stated that they regarded as one of substantial progress in all departments. The gentlemen admitted as members during the session numbered forty-seven; twenty-seven names had been withdrawn, owing to various circumstances, and there were now 303 on the roll. The report having been adopted, the office-bearers for the ensuing session were elected, viz., Mr. Hippolyte J. Blanc, president; Professor Baldwin Brown and Mr. John Kinross, vice-presidents; Mr. T. Fairbairn, hon. secretary; and Mr. John Whitelaw, hon. treasurer. On the motion of Professor Baldwin Brown votes of thanks were given to past office-bearers. The Chairman then read a continuation of a paper on Monastic Architecture in Scotland.

Glasgow Architectural Association. — On Saturday afternoon last a party of the members visited the Cathedral, and were conducted over the building by Mr. John Honeyman, F.R.I.B.A. Under his guidance the various portions, from crypt to tower, were seen, and their dates of erection learned, a running commentary on the purposes of the different parts, and the intention of the builders where these appear to be departed from or unfulfilled, rendering the inspection a most interesting and instructive one.

Liverpool Architectural Society.—The annua report of this Society, read at the meeting on the 3rd inst., shows a slight diminution in the number of members, the number now being 116, as compared with 121 at the close of last session. This number is made up of 42 Fellows, 22 Professional Associates, 27 Associates, 23 Students, and two Corresponding Members. There had been eight resignations, viz., two Professional Associates and six Students. Among the members deceased, mention is made in the report of the late Mr. Samuel Huggins, for many years a member of the Society, which was indebted to him for many contributions to the proceedings. Seven members had been elected, viz., one Fellow, five Professional Associates, and one Student. In the early part of the session the Council received, with regret, the resignation of the Hon. Sec., Mr. F. W. Hornblower, whose devotion to, and interest in, the welfare of the Society for the past eight years had contributed in no small degree to its continued existence. Mr. C. W. Blease had undertaken the duties of the office. The subject of the federation of architectural societies had frequently engaged the attention of the Council, who had given their support to the committee formed by the Royal Institute of British Architects, upon which Mr. C. Aldridge was placed, and Mr. Parslow has been nominated as the representative of the Society.

OBITUARY.

Mr. Sancton Wood. — Mr. E. C. Robins writes,—"As an old pupil of the late Mr. Sancton Wood, whose office I entered in 1846, I have been requested by his representatives to say a few words about him. He died on the 18th of April last, within a week of his seventy-first year, and was buried on the 24th at Putney Cemetery. He had resided in a house of his own design on Putney-hill for the last thirty-five years, and was formerly District Surveyor of Putney and Roehampton, but for the last twenty years he was District Surveyor of St. Luke's, Chelsea. He was a Fellow of the Royal Institute of British Architects, and was a member of the Examining Board for District Surveyors. He was also a Fellow of the Institute of Architects of Ireland, and an Associate of the Institution of Civil Engineers. He was articled to Sir Robert Smirke, but was turned over to Sydney Smirke, and remained Classical in his architectural taste and practice. He was engaged by Mr. John Braithwaite to design the station buildings on the Eastern Counties Railway, and was the architect of the old terminus at Shoreditch. He was the successful competitor for the Great Southern and Western Railway buildings in Ireland, and erected the Kingsbridge Terminus and the stations from Dublin to Cork. He was also architect to the Limerick Junction line, and, living at a time when architects were not quite elbowed out by engineers, he became architect of the Rugby and Stamford Railway, and the Syston and Peterborough Railway buildings in England. He was subsequently architect to several building estates, and built many private houses and London offices, notably those at the south-west corner of King-street and Gresham-street. In his later years he was much employed in arbitrations, and was an able administrator. He was married and had two sons, who preceded him to the grave."

We are asked to add to the above that in 1846 Mr. Wood received a premium of 100*l.* for his designs for the Blackburn Railway Station, offered by the Blackburn and Preston Railway Company.

* *Builder*, 1877, p. 189.

BUILDERS' BENEVOLENT INSTITUTION.

AN election of pensioners on the funds of this Institution took place on Thursday afternoon, at Willis's Rooms, St. James's, Mr. Arthur C. Lucas, J.P. (President), in the chair. There were three vacancies,—two for men, and one for a woman,—for which there were six candidates, five of whom were men. The following is the list of the candidates, with the number of votes polled for each, according to the report of the scrutineers (Mr. Thomas Stirling and Mr. Keeble), viz., John E. Rowe, Croydon, aged sixty-three, builder, 1,091 votes; Samuel Walton, Holloway (formerly a subscriber to the Institution), aged sixty-eight, builder, 1,283 votes (including 140 allowed for subscriptions); Ebenezer Robinson, Camberwell, aged seventy-two, builder, 953 votes; James Picking, Clapham, aged sixty, builder, 74 votes; and Thomas Norton, Brook-green, aged forty-six, 330 votes.

John E. Rowe and Samuel Walton were therefore declared to be the successful male candidates, and Mrs. Caroline Cleary, of Highbury Quadrant, widow of Joseph Cleary, builder, being the only female candidate, was elected as a matter of course.

Votes of thanks to the Chairman, proposed by Mr. Foxley, and to the scrutineers and other gentlemen who had taken part in the proceedings brought the meeting to a close.

CASES UNDER THE METROPOLITAN BUILDING ACT.

NEGLECT TO SUBMIT PLANS TO DISTRICT SURVEYOR.

AT the Hammersmith Police Court on Saturday, Mr. Harris (Harris & Wardrop), contractor, was summoned for omitting to produce to Mr. Knightley, the District Surveyor, plans and sections showing the constructions of proposed stabling for Messrs. Carter, Paterson, & Co., in Glenthorne-road, Hammersmith.

Mr. Knightley said he sent formal notice to the builders for plans, but without effect.

The defendant said his foreman called one day at Mr. Knightley's office. He only saw a junior clerk, and refused to leave the drawings. He (the defendant) added that Mr. Knightley could have seen the drawings at the building at any time.

Mr. Knightley contended that the production of the drawings meant in such manner that he should have time and a fair opportunity to examine them.

The Magistrate, Mr. Bennett, expressed a similar opinion, and imposed a penalty of 3*l.*, with costs.

WHAT IS A PARTY-WALL?

AT the Worship-street Police-court, on Wednesday, Mr. James Stone, a builder, of Walthamstow, was summoned under the Building Act for so irregularly building a certain party wall that it did not rise 15 in. above the roof.—Mr. Jutsum, solicitor, appeared on behalf of the prosecuting surveyor, Mr. Meeson, of the District of East Hackney North; and Mr. Adam Burn, barrister, defended.

The defendant, it appeared (we quote from the report in the *Daily Telegraph*), was the contractor for certain buildings being erected in Theydon-road, Hackney; and the point of the case was whether the wall in question was or was not a "party" wall within the meaning of the Act. If a "party" wall it was necessary that it should be carried up above the roof at least 15 in., whereas the evidence of Mr. Meeson showed that the wall was covered by the roof. There was no contention as to the facts, and it was shown that the buildings in question were intended for "model dwellings," and are being erected in eight "blocks."

The defence was that the total area of the "block" in question was only 1,200 ft. super., whereas 3,600 ft. was the allowance under the Act for areas without party walls.

Mr. Meeson's contention was that the wall, being the boundary of the "separate dwelling," as "model dwellings" are let, was a "party" wall, and a long discussion as to the bearing of the Act took place on the point; the Act, it was submitted by Mr. Jutsum, being sufficiently clear in its definition of a "party wall" by stating that it should "apply,"—a word which Mr. Hannay remarked was very oddly used in that connexion,—"to any wall separating a building from another building occupied by different persons."

Mr. Hannay said that if that view of the matter was to be held good, a set of chambers would require a "party" wall.

The solicitor submitted that they did, and that the "flats" of "model dwellings" were "separate dwellings" was clear from the Representation of the People Act, which treated them as dwelling-houses.

Mr. Hannay said that it was well known that separate occupation was a "separate dwelling" for voting purposes; but if a separate occupation was a "separate dwelling" within the meaning of the Building Act no person could let a portion of a house to a lodger without putting up a party wall from roof to basement.

Mr. Burn cross-examined to show that for every "separate" dwelling, District Surveyors under the Act were entitled to a fee about six times greater than that allowed for a mere survey of so many floors, &c. Therefore, if Mr. Meeson were to succeed in his contention, it would be greatly to his benefit.

Mr. Hannay thought that point need not be pursued.

Mr. Burn having addressed the Magistrate for the defence,

Mr. Hannay said that he could not go with the contention for the prosecution, that a set of chambers or "rooms" was a separate building; and he was helped to that opinion on reading the 27th section of the Act, which said that every building should have its "external or party wall." In his opinion the wall in question was not necessarily a party-wall; therefore the defendant was not bound to carry it above the roof, and the contention for the Surveyor must fail. He dismissed the summons, and ordered the Surveyor to pay the defendant two guineas costs.

TALL CHIMNEY CONSTRUCTION.

SIR,—Your correspondent "J. H. G." (page 694, *ante*) having put six queries to the readers of your paper, and especially asked me to reply, with your permission I will endeavour to do so, taking them *seriatim*, embodying in the answers the opinion and experience of men who have practically superintended the erection of this class of work, both in England and America, for many years.

Cement Rings.—The whole of the chimney should be built with good lime-mortar, and *not* with cement rings every yard in height. Some shafts have been built with cement rings: probably it is thought this prevents cracking, but I know chimney-designers and builders in the counties of Lancashire, Nottinghamshire, and Kent who use good lime-mortar throughout because they are convinced it is better to preserve the homogeneous character of the structure.

Concrete Chimney.—I only know of one shaft being built in concrete,—that is at the Chain Cable and Anchor Testing Works, Sunderland, and is described and illustrated in our book. If any of your readers know of other examples I hope they will communicate the same to the *Builder*.

Exhaust Steam.—The discharge of exhaust steam into the chimney cannot always be avoided, but it is very rarely done. I know a case in the City of London where the exhaust steam is conveyed into the chimney-shaft, but this was arranged to avoid causing a nuisance to the opposite premises. The responsible person in charge considers it detrimental to the brickwork. Some chimney-builders say that exhaust steam injures the draught when discharged up the shaft, as the steam forms itself into a column and takes up the centre of the chimney, and saturates the smoke. The vapour clings to the chimney sides and causes a wet lining of soot on the brickwork, and so affects the mortar that it falls from the joints every time the fires are stopped. The face of the brickwork will peel off when touched, similar to plaster on a damp wall. The whole length of the flue from where the steam enters is wet and slimy on all sides, and there is a constant downpour of soot and grit accumulating at the

base, which causes 25 per cent. more dirt than if no steam entered, and the damp and dirt in the flue make the chimney more unhealthy and laborious to the men employed.

Portland Cement.—The Liverpool Corporation specify their cement as follows,—it must be of uniform quality and capable of bearing the following tests to the satisfaction of the engineer:—

"1st. Samples of the cement being sifted through a No. 50 gauge wire sieve, must not leave a residue of more than 10 per cent.

2nd. Samples of pure cement will be gauged with water and placed in brass moulds used by the corporation. Within twenty-four hours the casts thus made will be immersed in still water, in which they will remain until the expiration of seven days from the date of moulding, when they will be taken out of the water and tested to ascertain their tensile strength, which must not be less than 1,000 lb. on the sectional area of 2½ square inches.

3rd. In ordering the cement it will be distinguished as quick-setting or slow-setting. In order to ascertain the time of setting a modification of Vicat's needle will be used, having an area of 1-400th part of a square inch and a total weight of 2½ lb. The slow-setting cement must take an impression from the needle when standing vertically upon it at any time within three hours after moulding. The quick-setting cement must take the impression only during the first half-hour."

"J. H. G." should not overlook the important provision as to the amount of water to be used in moulding briquettes for testing. An excess of water will adversely affect the result; the right proportion is 9 oz. to 40 oz. of cement, as given in Grant on the "Strength of Cement."

Shafts out of Perpendicular.—There is a chimney in Lincoln upwards of 140 ft. high from the ground-line, which stands considerably out of plumb, and has been so many years. Inspections have been made two or three times during the last twelve years, and it shows no alteration. Some years ago I saw several moderate-sized engine-house shafts in the Staffordshire mining district, a little out from the vertical, owing, I suppose, to the subsidence of the ground from removing the minerals.

Mortar or Cement, when exposed to great Heat.—I presume that "J. H. G." asks this quite apart from the question of fire-brick lining, which, of course, is always set in fireclay. I have found that practical chimney builders consider that brickwork in mortar will stand greater heat than brickwork in cement. Your correspondent will also find the following authorities agree with this:—

Hurst's "Surveyor's Pocket-book," twelfth edition,—"Mortar is generally preferred to Portland cement in the erection of chimneys, as the latter does not stand the heat well."

T. Box on "Heat," fourth edition,—"Mortar should be used for the most part, because cement is destroyed by a strong heat; the 4½ in. work at the top, however, should be in good cement. With so thin a wall the heat is rapidly carried off by the external air, and the cement will not be injured."

R. Wilson, on Boiler Chimneys, says,—"Cement, owing to its crumbling when exposed to a high temperature, cannot be recommended except for the top of the chimney, where it may be usefully employed."

R. M. BANCROFT.

ARCHITECTURAL ASSOCIATION.

SIR,—For the benefit of those who were unable to attend the supplementary lecture on the History of Architecture last Saturday, and who have written to me for information, I would say that, after looking at Assyrian, Persian, Egyptian, Greek and Roman work at the British Museum, we visited the following buildings:—St. Bartholomew, Smithfield, for Norman; the Temple Round Church for Transitional; the Temple (eastern portion) and St. Bartholomew's western doorway for Early English; St. Etheldreda's, Ely-place, for Geometrical; Austin Friars church for Curvilinear; Great St. Helen's for Rectilinear; Lincoln's Inn gateway for Tudor; Middle Temple Hall for Elizabethan; Whitehall for Inigo Jones; Bow Church for Wren; the Adelphi for Adams; and Somerset House for Sir W. Chambers.

It would have been easy to begin with the Confessor's work at Westminster and to have filled up many gaps in the list, as London is still capable of showing a connected series of styles from Anglo-Saxon to the beginning of this century, but the above had to be seen in the course of an afternoon.

EDWARD J. TARVER, Lecturer.

ARCHITECTURAL ASSOCIATION EXCURSION TO ROME.

SIR,—Those of your readers who have taken an interest in the scheme which I brought forward several months since for short excursions to Rome will have gathered from the notices you have printed during the last few weeks that the first of these excursions has been successfully carried out. It happened that I was at Rome at the time of the visit, and saw the party at other places, and I feel extremely gratified with the result. The labour of getting up this excursion and of conducting it was undertaken by Mr. H. D. Appleton, one of the Hon. Secretaries of the Architectural Association, and while I shall be very glad to promote any further excursions made with the view of seeing the best examples of the architecture of Italy, Mr. Appleton will be happy to place the experience he has gained at the service of any students who may apply to him.

The party that has recently returned will combine to put on record in some suitable way the impressions they have received during their short visit to Italy. THOS. BLASHILL.

FULHAM VESTRY HALL COMPETITION.

SIR,—We have received the following letter from the Vestry in reply to our inquiry as to whether they would appoint a professional assessor for the so-called second competition, for which, with our reply, we shall be glad if you can spare space in your next issue.

NEWMAN & NEWMAN.

19*a*, *Tooley-street, London Bridge*,
May 20, 1886.

[COPY.]

"Vestry Offices, Walham-green,
May 19th, 1886.

DEAR SIRS,—I beg to inform you that at the meeting of the Fulham Vestry held last evening, it was resolved to adhere to their resolutions of the 6th of April last not to appoint a professional adviser to examine the amended plans, and to make no alterations in the date for depositing the amended plans.—I am, dear Sirs, yours faithfully,

CHARLES J. FOAKES,
Clerk to the Vestry."

"DEAR SIR,—We are in receipt of your letter of yesterday, and are not at all surprised at the course your Vestry have taken, as it fully confirms our views as to the 'straightforward' way in which this competition has been conducted, and also confirms the report we have heard upon good authority that the work was from the first intended for a local architect.

In answer to your Vestry's advertisement, about seventy-five architects have expended their time and money uselessly, and as neither the designs under the mottos 'Clavius' or 'Truth' (the authors of which are known to us) were considered by Mr. Currey worthy of notice, the Vestry has now given them an opportunity of altering and amending their designs at the expense of the other competitors, and has reserved to itself the rights of final selection. After this we will say no more in the matter, but will leave those interested to form their own opinions.—We are, dear Sir, yours truly,

C. J. Foakes, Esq." NEWMAN & NEWMAN.

BELPER UNION INFIRMARY COMPETITION.

SIR,—Accompanying the "Instructions" for this competition is a drawing comprising plan of site, levels, and an elevation of the present infirmary. This drawing bears the name of a Belper architect, and it would be well for intending competitors to ascertain (if they can) how this gentleman stands with reference to themselves.

Many of your readers will remember that a few months ago the Birmingham Guardians advertised for designs for an infirmary to cost 60,000*l*. There were only six competitors. And why? Simply because it oozed out that a local man had already prepared designs, and inspected other infirmaries in company with the guardians. Moreover, it was stated that it was only by the casting vote of the chairman that a competition was decided on. May not the Belper case be a parallel one?

Competitors are asked to give "an accurate estimate" of the cost of carrying out their designs, but the Guardians give no indication whatever of the amount they intend to spend. Doubtless this is one point, among others, in which outsiders will be heavily handicapped.

The Guardians deserve credit, however, for being quite clear on one matter. The last clause of the "Instructions" reads:—"The Guardians do not intend to appoint an assessor."

NOT A COMPETITOR.

The Statue to Mr. Samuel Morley at Bristol.—We are informed that Mr. Havard Thomas has secured the commission for the Samuel Morley memorial statue, which is to be erected at Bristol. The figure is proposed to be of heroic size, and will be placed upon a pedestal of granite. Mr. Thomas's commission is the result of a competition in which his model was successful.

PROVINCIAL NEWS.

Abingdon.—The Corn Exchange here was formally opened on the 5th of May. It occupies a prominent site in the Market-place, and is built of red pressed bricks, with white bands, &c. The interior is 80 ft. by 45 ft. The interior walls are of white bricks from Bridgwater, relieved by red brick dressings. There is also some effective ornamental brickwork introduced, by Poulton, of Reading. The roof is open, with wood principals and iron trusses of special design. There are four openings on one side and out of the hall, forming shops. The platform is specially designed for concerts and other performances, and has two retiring-rooms below, with separate entrances. The main entrance is in the front, with an extra one at the side. Over the entrance is a gallery for ladies. The roof lighting is by Rendle's patent glazing on the north side. The front gable is surmounted by a stone figure of Ceres, by Mr. W. Frith, of London, the gift of Mr. J. Heber Clarke, who was mayor of Abingdon when the building was commenced. The architect is Mr. Charles Bell, of London, whose design was selected in a limited competition on the award of Professor Hayter Lewis. Mr. Williams, of Abingdon, was the builder. The contract sum being 1,840*l*.

Aylesbury.—A new wing has been built at Messrs. Hazell, Watson, & Viney's extensive printing works at Aylesbury. The working-space now afforded is nearly an acre in extent, and consists of eight floors, each measuring 100 ft. by 40 ft., and some additional ground-floor space. Access to both buildings is obtained from a stone staircase, built in a tower between the two buildings. There is scarcely a partition in any of the floors, so that each floor forms a light and cheery space for each department of the business. Would that this could be said of all printing-offices! The architect was Mr. P. H. Watson. The building work was done by the firm without contract, Mr. Jesse W. Landon being the building foreman; and the whole of the details were carried out under the immediate superintendence of Mr. Jowett.

Brooklands (*Cheshire*).—On the 13th inst. the Bishop of Chester opened the parish room recently erected at Brooklands from the designs of Mr. Charles Heathcote, architect, Manchester. The room is in connexion with the church of St. John the Divine, is cruciform in plan, and will accommodate 325. The two arms of the cross can be separated from the remainder of the building by folding-screens. A vestry, a room for the preparation of refreshments, and two retiring-rooms complete the plan. The porch, containing two sets of folding-doors, is warmed, like the remainder of the building, with high-pressure pipes. The heating-apparatus chamber and a large store-room are in the basement. The building is lined above the wooden dado with bands of red and buff Ruabon bricks. The roof is open-timbered and wood-lined, and the internal fittings and floor are in pitch pine. The extract-ventilator, with current induced by gas-jets, is in a turret at the west end. The floors of the porch and tea-room are laid in mosaics. The builders were Messrs. Wilson, Toft, & Huntley, of City-road, Manchester.

Glamorganshire.—At Gower-road, in the county of Glamorganshire, a Conservative club has just been erected. The main structure, except the joiner's work, has been built by the workmen of the Elba Steel Works, under the direction of their foreman, Mr. George Beynon. The walls are built of slag from the works, and on the first story half timber-work is introduced. The slag, which is simply burned cinders from the furnaces, is put together with Aberthaw lime, the outside of which, between the timbers, is covered with rough-cast. The building contains reading-room, billiard-room, and a bagatelle recess, card-room, and bar-parlour; over these rooms is a large assembly-hall with open timber roof, and approached by a distinct entrance. Two class-rooms are provided. Adjoining the club is a cottage for the caretaker. Messrs. Brown, Thomas, & Johns, carpenters, of Llanelly, executed the woodwork, and the building was designed and carried out under the supervision of Mr. J. Buckley Wilson, architect, Swansea.

Newport (*Salop*).—At a recent meeting of the Newport Town Council, the General Purposes Committee recommended for approval plans of four streets submitted to them by the architects to the Newport Cottage Company, Limited,

and of two other new streets, one of which was in Caeraw Park, for Mr. J. A. Herbert. The Deputy-Mayor congratulated the town upon its prosperity, as indicated in the spread of building operations. The four new streets for the Cottage Company would provide 330 dwellings suitable for the poorer classes, and at rents within their reach. The recommendation was adopted.

Stoke-upon-Trent.—At the last monthly meeting of the Town Council, the Cemetery Committee reported that, having considered Mr. J. Forsyth's account for laying out the cemetery, and the report of Messrs. Milner thereon, they found that a deduction of 769*l.* 7*s.* 10*d.* out of his claim of 1,194*l.* 3*s.* balance of his contract and for extra work had been made by Messrs. Milner, who had certified a sum of 424*l.* 15*s.* 2*d.* as being due to Mr. Forsyth. The committee having considered the statement of accounts and Messrs. Milner's report, and the unforeseen difficulties Mr. Forsyth had had to contend with, owing to the unanticipated rocky nature of the ground, recommended that he be paid the sum of 500*l.* in total discharge of all claim. It was explained that besides the 424*l.* 15*s.* 2*d.*, there was 30*l.* due for shrubs, so that the proposal was to pay only 46*l.* beyond the certified sum; and Mr. Milner had informed the committee that Mr. Forsyth had had unexpectedly to contend with difficulties by reason of stone strata in many places not having been revealed by the borings. The Council, however, decided to adhere to the certificate of Mr. Milner, and not to pay so much as 500*l.*

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Ford (near Liverpool).—On the 9th inst. the foundation stones of a new church for the Convent of the Good Shepherd, Ford, near Liverpool, were laid and blessed. The new church, which will be dedicated to the Sacred Heart, is designed to accommodate three separate congregations, who will be present at worship in the building at the same time, all of whom must see the altar, but without any of the three seeing either of the others. To carry out this idea there are two naves, which will be separated by an arcading filled in with screens, one to be occupied by the nuns, and the other by the penitents, while the third body, the "externs," will be provided with accommodation in the transept running at right angles to the chancel. Near the chancel will be two arches, which will be connected by five arches with the chancel, supporting an octagonal lantern 30 ft. in diameter, and rising to a height of 54 ft. The total length is 88 ft., the internal width 52 ft., and the height will be 40 ft. Red brick, with dressings and Bootle stone, is being used in the construction of the building, for which Messrs. Pugin & Pugin are the architects, and Messrs. Roberts & Robinson, of Liverpool, the contractors. The cost of the building will be between 6,000*l.* and 7,000*l.*

Grays (Essex).—The first stone of a new school-chapel, &c., at Grays, was laid on the 19th ult., by Cardinal Manning. The new buildings are being erected from designs by Mr. F. H. Pownall, architect, Montagu-square, London, and comprise, on the ground-floor, schools capable of holding over 400 children, with a church above, to seat from 500 to 600 persons. The buildings are Early Gothic in character, and faced externally with stock bricks, of local manufacture, relieved with red bricks.

Greenhill (Swansea).—A new Roman Catholic Church at Greenhill, Swansea, in the diocese of Newport and Menevia, for the Very Rev. Canon Richards, O.S.B., has just been commenced. It is on a most picturesque site, and will be seen from all parts of the town. The architects are Messrs. Pugin & Pugin.

The Last of the Old "Cock" Tavern, Fleet-street.—The historical Cock Tavern in Fleet-street will shortly be replaced by the new buildings about to be erected by the Bank of England, and on Tuesday last the materials of the ancient hostelry were sold by Messrs. Horne, Son, & Eversfield. The new structure which the Bank authorities intend to erect on the site will have a frontage to Fleet-street of upwards of 90 ft.

STAINED GLASS.

Bexley.—The five chancel windows in the new church of St. John the Evangelist, Bexley, Kent, have recently been filled with stained glass by Mrs. Layton, of Bexley, in memory of her late husband, Edward John Layton, through whose instrumentality the building was erected and to which he was a munificent donor. The centre window represents the Crucifixion, and in those on each side, the subjects of the Good Samaritan and Our Lord blessing little children, have been respectively illustrated. The extreme north window contains the figures of St. Peter and King Edward in niches under rich canopies, and on the extreme south St. John the Evangelist and St. Paul similarly arranged. In the quatrefoils of the centre window is the *Agnus Dei*, and in the four others the emblems of the four evangelists. The windows are all two-lights, and have been executed by Messrs. Burlison & Grylls under the supervision of Mr. George Low, the architect of the church.

Penn (Bucks).—The parish church of Tyler's Green, Penn, Bucks, has just received two Munich windows, one representing St. David, in memory of Mr. James Plaistowe, of Landwater, and the other containing a figure of St. Margaret, in memory of Margaret Amelia Rose. The work has been designed and carried out by Messrs. Mayer & Co.

Westwood (Coventry).—Westwood Church has been enriched by a stained glass memorial window to the Vicar's wife, who died last year: the window was unveiled on Easter-day. The subject represented is Our Lord meeting Martha and Mary. In the tracery is an emblem of the Trinity. The window was designed and executed by Messrs. F. Holt & Co., Warwick.

Winchester.—A memorial window to Lord Chief Justice Erle, who was a devoted Wykehamist, has been placed in a window of the south aisle of the cathedral nave, directly before the south face of the chantry of Wykeham. It is by Messrs. Clayton & Bell, and has been provided by Lady Erle. It is of six lights, with trefoil heads, in which are the college arms, the Erle arms, and an angel with an open book. The six lights are filled with figure subjects. In the upper tier are Wykeham, in full pontificals, and Bishop Ken, vested in the robes of the Protestant bishops. Between these two is the Virgin, to whom the two colleges are dedicated, holding the Divine Child. The second row includes figures of Faith, Charity, and Justice, with their conventional symbols and attributes.—*Hampshire Independent.*

The Student's Column.

OUR BUILDING STONES.—XI.

ON THE ORIGIN AND STRUCTURE OF SANDSTONE.

THE rocks included under this heading constitute a large class of building materials. They are composed mostly of grains of quartz cemented together by various kinds of mineral matter.

Sandstones are essentially aqueous rocks,—that is, they were formed in water, and the great majority of those used in building were laid down in the sea not far from land; for the quartz grains of which they are composed were derived from the denudation of the land. In the first instance, the grains were no doubt obtained from the wearing away of crystalline rocks containing quartz, but the majority of the sandstones formed at later periods were largely made from the destruction of pre-existing arenaceous rocks. Many sandy deposits now in process of formation, for instance, have obtained the materials of which they are made from the denudation of the sand-cliffs along our sea-coasts.

Suppose we follow out the formation of a sandstone the quartz in which has been derived directly from a crystalline rock, such as granite. The felspar, as previously stated, would decay, and, being borne out to sea in the form of mud, would form clay. Part of the mica would also be removed, thus leaving the remainder of the mica and the quartz loose. These the sea would eventually seize hold of, the mica being carried away some distance from the beach at an early stage in the process, but the quartz crystals would be rolled to and fro on the beach, knocked together and broken, their rough, jagged edges being worn off whilst being made into pebbles. The pieces resulting from this fracturing would be of various sizes, and the smaller pieces or grains of quartz, being small enough for the water to hold in suspension, would then be carried away from the shore. If we still follow these little grains up we shall find that as the velocity or drifting action of the water became insufficient to suspend them, they would fall to the bottom, being quietly deposited there. It often happens that flakes of mica are deposited with the quartz, and are so arranged in thin layers that, when the sand becomes hard, it assumes a fissile character, which renders it capable of being split up into flagstones (see *ante*, p. 694).

Little pebbles would be frequently deposited in the coarser sand.

As molluscs and other organisms living in the sea died, their remains would be covered up by the deposit of sand, and unless subsequently removed, would be handed down to us as fossils. The accumulation of sand in time might become very great when the upper part of it, exerting considerable pressure on the lower, would cause it to become compact.

Although it has been shown that pressure alone is sufficient to make particles of sand cohere into a hard mass, yet by far the greater quantity of sandstone quarried for building purposes has a matrix or cementing material. This in most cases has been introduced into the stone after the sand has been laid down, for water in percolating it has left behind some of the chemicals which were held in solution, and these, forming round the grains of sand and filling up little spaces, made the mass hard,—in other words, made the sand into a sandstone.

A microscopic examination of sandstone imparts a considerable amount of useful information. Then it is seen that a specimen, which from outward appearance was not suspected to contain any grains but those of quartz, is made up also of minute particles and fragments of other minerals. This is a feature of much interest. If the specimen contained a more than usual quantity of silicate of alumina with potash, lime and soda, there is just the possibility that minute particles of felspar are present, but as the analysis would only give the aggregate chemical composition, we could not be quite sure in what form those chemicals occurred. An examination of a thin section of the rock would go far to settle points like these.

Little opaque grains of some form of iron are frequently seen under the microscope. These are waiting to be attacked by the atmosphere, and by their decay cause unsightly ferruginous lines to run down the surface of the stone when built up. The microscrope is also useful in pointing out the state of cohesion of the quartz grains, and to some extent the nature of the matrix. If, for instance, the grains are rather far apart, and the mineral calcite appears between them, the stone would not be very durable, but more so than when the carbonate of lime existed, as it very often does, in an earthy form. If, on the contrary, the small quartz grains are close together, and the little matrix present looks firm, that is, does not present a decomposed, woolly appearance, the stone would be durable and easy to work. It would be still more durable if little veins, presenting the granular structure peculiar to chalcedony, or secondary quartz, were seen running here and there between the grains of quartz, although we should remember that the more siliceous the matrix is, the more difficult the stone becomes to work up.

If the sandstone under examination contains many shells, the mineral composition of those shells should be ascertained. Their original composition is often replaced by silica, but occasionally they are made of some form of carbonate of lime, and might then be submitted to the method of microscopic analysis for the determination of the particular form as described on p. 695.

LIMESTONE.

This class of stone is raised extensively for building purposes in many parts of the country, but often occurring in the midland and northern counties close to sandstones of better quality, limestones are not so generally used as they might otherwise be.

We will first consider the origin of limestone. Although sometimes deposited chemically, the greater quantity of carbonate of lime derived from the denudation of rocks, which is

rought to the sea by rivers, is eliminated by he agency of molluscs and other organic life. These organisms having died, and their shells being covered up by other shells, after a lapse of time such an accumulation takes place, and the deposit becomes so thick by the augmentation of shell sand, that the underlying portions are subjected to such a pressure as to make them tolerably compact. The deposition of different minerals from percolating water, subsequently aids the whole in becoming a limestone. The shell-sand is formed of broken up and pulverised shells. It is not difficult therefore to see why limestones contain so much shelly matter. One of the best known limestones is chalk, which is often used locally as a building material. On examination with the microscope this rock will be found to be almost wholly made up of the broken, and more or less perfect shells of marine organisms.

Several limestones found in this country and elsewhere, were evidently at one time coral reefs, as they are composed of the skeletons of those animals built up one upon another. In some instances, the character of these reefs has been gradually obliterated by the passage of percolating water through them, which has dissolved and re-deposited the carbonate of lime, of which the corals were made. In this way a crystalline structure, formed of organic remains, has been set up, without the agency of subterranean heat.* Other limestones appear to have been similarly affected.

The microscopic structure of the little spherules which, together, help to form oolitic freestones, was described on p. 695. These little egg-shaped bodies were probably formed in water charged with a considerable proportion of carbonate of lime, and under the influence of gentle currents which drifted along the grains of quartz or fragments of shells now forming their nuclei. The carbonate of lime would be deposited on any surface suitable for its reception, such as that presented by these grains and fragments, and continual motion being kept up during deposition, it would form in layers round all sides of them. Such an action is proceeding in some parts of the globe at the present day.

The fact that grains of sand often form the centres of these oolitic spherules, and that sand frequently also occurs distributed throughout the rock, accounts no doubt in some measure for the silica which a chemical analysis shows is present in some limestones. We may remark that where this is the case the silica has no preservative action whatever, as, directly the oolitic grains forming the rock decompose, and the carbonate of lime is removed, the grains of sand, being loosened, simply fall out, having nothing to support them.

The microscope, however, often shows us that all the silica present is not confined to the grains of sand, but that some of it is distributed in a vein-like manner between the spherulitic bodies. When this is the case, the stone would show rather a high "crushing weight," and although, perhaps, it might not be a very good freestone, it would be much more durable than the ordinary limestones used in building.

Those rocks which are largely composed of carbonate of lime and carbonate of magnesia are called dolomites or magnesian limestones. They are often crystalline in character. In some instances, dolomites appear to have been formed by an original chemical precipitate from the saline water of inland seas.† In others, the rock has been altered to a great extent by heat and pressure, and a crystalline structure thus set up. Thirdly, they have been formed by the abstraction of carbonate of lime from those which contained but little carbonate of magnesia, and they may then have had their proportion of magnesium carbonate increased by the action of percolating water. It has been shown that shells and other organic remains originally made of calcite or aragonite have been converted into dolomite in this manner.

Limestones of fresh-water origin have been used in some districts for ecclesiastical ornamentations. Purbeck marble, for instance, was much employed in this manner, in many of our cathedrals and churches for slender shaftings, tombs, &c. This stone is sometimes also known as "paludina" marble, from the fact that it is largely made up of the fresh-water shell of that name.

Although a large number of limestones are comparatively free from foreign matter, it is evident from their origin that such must to some extent occasionally be present. Unless formed under very favourable circumstances, clay, iron, and bituminous matter, in addition to the sand, before referred to, will be more or less prevalent in them. The methods of detecting these impurities have been described on p. 491.

FLINT.

This material is largely used for churches, &c., in districts where it is abundant. Most of it comes from the upper part of the chalk, the lower chalk containing but very little. As it hardens on exposure to the atmosphere, it is more easily dressed when fresh from the chalk-pit than when it has been lying about for some time. It is composed of silica, but frequently contains impurities such as iron.

Flint has been formed in various ways. It is often found enveloping sponges and other organic remains in such a manner as to leave but little doubt that much of it accompanied the deposition of the chalk, though why it should have a tendency to form in lines as it does is not very clear. It is certain that some flint at least was not formed until the chalk was made compact, because it is found filling cracks which were not in existence before the chalky deposit was considerably dried, the cracks being formed during the contraction consequent on drying. Water holding silica in solution appears to have permeated the chalk, leaving that oxide behind in the cracks and joints.

Unless flint is very impure it will last for ages when built up. The principal thing to look to in constructing a building of flint is the cementing material or mortar.

* See Dana's "Coral and Coral Islands," p. 354.
† See Sterry Hunt, "Geology of Canada" (1863), p. 575.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

609, Ventilating Buildings. E. Tomlinson.

A series of outlets are made from the rooms, &c., into the various chimneys, the smoke being collected by suitable cowls fixed on the ordinary chimney-stack. In the case of a single building the cowl may be continued over the roof or down the side in such a manner as to cause the condensation of the smoke. An artificial exhaust is employed, and after treatment of the smoke the gases are discharged by an up-take-pipe, into the atmosphere above the roof.

831, Measure. W. R. Lake.

Along the side or upon the back of the tape measure or scale is printed a corresponding logarithmic scale, so that calculations of cubical contents, &c., may be readily made.

843, Disinfecting Apparatus. J. Robertshaw and J. T. Turner.

Consists of a vessel, round the rim of which is a channel or gutter, and inside of which is suspended, from suitable supports, a metal plate, wire, or disc, or other suitable flat surface, on which sulphur may be burned or volatilised.

884, Hardening Stone, Cements, &c. B. J. B. Mills.

This invention consists in economising cements, &c., in the formation of agglomerates not of a marly or earthy nature, permitting the employment therein of vegetable matters, such as hay, algæ, sawdust, &c., and hardening, without baking or compression, by the addition of rock alum and a suitable sulphate. The materials are mixed and shaped, dried, and immersed for twenty-four hours in a solution of any suitable sulphate, preferably zinc sulphate, with the addition of rock alum. The compound may be dried and again immersed in a bath of greater density than the first, or the immersions may be replaced by three or four waterings at intervals with the same liquid. Vegetable materials thus bound together may be made into partitions, hollow vessels, boats, &c. The mixture of rock alum and a sulphate may be applied for the preservation of public monuments, &c., for hardening soft stones, plasters, &c., for incombustible coatings for woodwork, &c., for coating ships' hulls, conduits, &c., and for other purposes.

896. Strengthening Wooden Mallets. A. J. Boult.

The working surfaces of mallets, the wooden handles of tools, &c., where the surface of the wood is at right angles to the grain, are strengthened by strips of tough wood, raw hide, indiarubber, &c. (but not metal), which are bevelled at the ends, bent round to a circular form, so that the ends overlap, or to a spiral form, and, lastly, glued and pressed into circular recesses in the article to be strengthened.

897, Manufacture of Tiles. A. J. Boult.

An hexagonal receptacle or basket is mounted on a vertical shaft by which it may be rotated at a high speed. Moulds having glass backs for the purpose of producing a smooth surface are arranged on the interior of each of the sides. The sides are hinged so that they may be opened outwards for removing the moulds. The material which is to form the surface of the tile is fed in first while the shaft is rotating, and the material to form the body is fed in afterwards. When the tiles are of sufficient thickness the basket is removed and a fresh one substituted. The apparatus may be modified to render it applicable to other articles than tiles.

NEW APPLICATIONS FOR PATENTS.

May 7.—6,176, J. Deeley, Flushing Cisterns.—6,182, R. Little, Sash Windows.—6,196, J. Fryer, Chimney Cowls.—6,207, W. Baker, Ornamentation of Mouldings.—6,212, E. Edwards. Compressed Blocks for Building.—6,221, C. Williams, Fireproof Floors.

May 8.—6,238, W. Pringle, Mitreing.—6,268, H. Lake, Rock-drilling Machines.

May 10.—6,292, G. Sharp, Oscillating Chimney-Top.—6,309, J. Reid, Lavatory Basins, Baths, Water-closets, &c.

May 11.—6,312, J. Mason, Windows.—6,336, W. Chambers, Screw Driving.—6,337, W. Hulse, Spirit Levels.—6,352, J. Wilson, Securing Lock or Door Handles or Knobs to Spindles.—6,370, R. Lavender, Oxide of Iron Pigment Colour.

May 12.—6,379, D. Frew, Hinges and Fastening Devices.—6,389, J. Kershaw, Wood-planing Machines.—6,402, G. Innes, Hob Grates.

May 13.—6,426, W. Parry, Construction of Floors, Roofs, and Arches, of Bricks, Terra-cotta, Stones, &c.—6,437, G. Gopsill, Spindle for Door Locks.

May 13.—6,441, N. Rosekilly, Centre-boring Bits.—6,452, H. Haddan, Tonguing Wood or Stone.

PROVISIONAL SPECIFICATIONS ACCEPTED.

3,388, H. Dempewulf, Smoke-consuming Fireplaces.—4,521, A. Boult, Earth Closets.—4,733, G. Body, Fastening for Casement Sashes, Doors, and Fanlights.—4,943, T. Twyford, Closet Basins, &c.—4,953, M. Cleary, Flushing Water-closets.—5,131, C. Gordon, Domestic Grates.—5,167, J. Smalley, Preventing Down-draughts in Chimneys.—5,661, W. Williams, Portable Scaffold.—4,860, A. Gross, Window-sash Fastener.—4,886, S. Worsnop, Fixing Iron Laths and Slates to Iron Roofs.—5,007, C. Hengst and J. Shake, Window-sash Fasteners.—5,088, C. Ewing, Fasteners for Window Sashes.—5,175, S. Bott, Cupboard Turns, &c.—5,187, W. Walker, Ornamenting Glass for Covering Walls, Ceilings, &c.—5,238, F. Milan, Hot-water Apparatus for Warming Rooms.—5,286, E. Staples, Attaching Door-knobs to Spindles.—5,317, W. Westley and J. Peers, Ventilators.—5,371, J. Macmeikan, Inlet Ventilators.—5,553, J. Dyson, Chimney Cowls or Tops.—5,844, C. Howe, Manufacture of Cement or Plaster.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

6,085, H. Lake, Protecting Wood from Moisture.—8,026, J. Coulter, Machinery for Dressing or Planing Stone, Marble, &c.—8,139, G. Redfern, Rendering Wood Incombustible.—8,437, S. Ingham, and Others, Woodworking Machinery.—8,533, R. Harrison, Attaching Door-knobs to Spindles and Doors.—8,552, S. Ingham and Others, Woodworking Machinery.—9,215, H. Doulton and J. Slater, Embossing and Decorating Window and other Glass.—15,512, W. McGowan, Screw Drivers, Gimlets, &c.—4,285, R. Shaw and W. Wenham, Casements.—7,409, J. Brooke, Oval or Elliptical Soldering Machine.—12,762, J. Belfield, Furnace for Burning Bricks, Tiles, Pipes, &c.—5,127, R. Cardwell, Stench Traps and Street Gullies.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

MAY 8.

By G. B. SMALLPEICE.

Guildford—17 and 18, Quarry-street, freehold £747

MAY 10.

By R. A. NOTLEY.

Aldersgate-street—Glasshouse-yard, freehold building site, area 5,000 ft. 2,620

By CHESTERTON & SON.

Kensington—40, 46, and 48, Church-street, freehold 3,330
6, Hornton-street, 16 years, ground-rent 6*l.* 5s. ... 450
42, Argyle-road, 68 years, ground-rent 12*l.* 1,770

By WEATHERALL & GREEN.

Islington—2, 3, and 7 to 9, Upper Winchester-street, 57 years, ground-rent 29*l.* 1,480

MAY 11.

By WALKER & RUNTZ.

Camberwell—45, Wells-street, known as Sykes' Wharf, 27 years, ground-rent 20*l.* 200

By WALTON & LEE.

Portman Estate—71, George-street, 42 years, ground-rent 3*l.* 2,110

By C. & H. WHITE.

Walworth—66, 68, and 70, Boyson-road, 65 years, ground-rent 18*l.* 18s. 1,210
Westminster Bridge-road—4, Carlisle-street, freehold 500
Forest Gate—7, 9, 11, and 13, Parliament-place, freehold 715
Harrow—1 and 2, Rokeby-villas, freehold..... 345

By TABERNACLE & SON.

Hackney—2, Wellington-terrace, 52 years, ground-rent 5*l*. £265
Notting-hill—5, Faraday-road, 80 years, ground-rent 7*l*. 300

By FAREBROTHER, ELLIS, CLARK, & Co.

Epsom—"Wodcote End House," and 5a. 0r. 34p., freehold 3,900

By WINSTANLEY, HORWOOD, & Co.

Walthamstow, Stainforth-road — Wimborne House, 94 years, ground-rent 5*l*. 255

By Messrs. ELGOOD.

Marylebone—122, Harley-street, 28 years, ground-rent 80*l*. 2,500
Sydenham—18, Kent-terrace, 80 years, ground-rent, 9*l*. 300

By E. & H. LUMLEY.

Oxon, near Dorchester — Burcot House, and 242a. 2r. 3p., freehold 14,950
Enclosures of freehold land, 105a. 1r. 18 p. 3,850

By DEBENHAM, TEWSON, & Co.

Brixton—124, Loughborough-road, 36 years, ground-rent 6*l*. 310
Paddington—65, Cirencester-street, 70 years, ground-rent 6*l*. 200

MAY 12.

By HARDS & JENKINSON.

Montserrat—The River Head Sugar Estate, containing 198 acres 600
The Quitt's, Bethel's, and Luther's Sugar Estates, 604 acres 1,300
Jamaica—The Phœnix Sugar Estate, 614 acres 2,000

By BRAY, WEBB, & Co.

Chelsea—31 and 33, Denyer-street, 23 years, ground-rent 4*l*. 510
Marylebone—23, Church-street, 36 years, ground-rent 47*l*. 5*s*. 120

By WOODS & SNELLING.

Dalston—58, Graham-road, 65 years, ground-rent 4*l*. 18*s*. 350

By M. LIELL.

Forest Gate—55 to 65 odd, Howard's-road, 79 years, ground-rent 18*l*. 10*s*. 470
Bromley—190 and 210, Brunswick-road, 86 years, ground-rent 8*l*. 515
Forest Gate—61, Stracey-road, 90 years, ground-rent 4*l*. 10*s*. 180

By E. JACKSON & SON.

Mitcham—43, Graham-avenue, freehold 580

By F. JOLLY & Co.

Wandsworth—Ground-rents of 38*l*. 10*s*., reversion in 97 years 840
Mile End—14 and 16, Eric-street, 73 years, ground-rent 10*l*. 10*s*. 420
Bermondsey—Ground-rents of 15*l*. 15*s*., reversion in 59 years 380

By H. J. BLISS & SONS.

Bethnal-green—117, Bishop's-road, 54 years, ground-rent 5*l*. 375
25 to 30, Peel-grove, 71 years, ground-rent 21*l*. ... 1,595

By D. SMITH, SON, & OAKLEY.

Westminster, Ambrosen-avenue—Two plots of freehold land, area 7,380 ft. 7,850

By D. L. GOOCH.

Anerley—Ground-rents of 48*l*. 10*s*., reversion in 93 years 1,075
Bromley—Ground-rents of 122*l*. 10*s*., reversion in 95 years 2,715
Selhurst—Ground-rents of 117*l*. 4*s*., reversion in 93 years 2,665
Peckham—Ground-rents of 22*l*. 1*s*. 6*d*., reversion in 91 years 520
Ground-rents of 32*l*. 10*s*., reversion in 75 years ... 750
Old Kent-road—Ground-rents of 52*l*., reversion in 69 years 1,210
Ground-rents of 50*l*., reversion in 77 years 1,265
Ground-rents of 13*l*. 10*s*., reversion in 63 years ... 390
Ground-rents of 15*l*. 15*s*., reversion in 64 years ... 340
Ground-rents of 7*l*. 7*s*., reversion in 64 years 180
Ground-rents of 15*l*., reversion in 66 years 450
Ground-rents of 20*l*., reversion in 68 years 500
Ground-rents of 21*l*. 18*s*., reversion in 65 years ... 525

MAY 13.

By GLASIER & SONS.

Wimbledon—Freehold land, 9a. 3r. 3p. 6,000
Twickenham, Sherland-road — Hill Villa, freehold 1,270
The Grosvenor School, freehold 2,980

By R. J. COLLIER.

Hackney-road—125, Great Cambridge-street, freehold 565
Wood-green—1 to 4, Clarence-road, freehold 1,480
Ground-rents of 14*l*., reversion in 76 years 340
1 and 2, Suffolk-villas, freehold 745

By EASTMAN BROS.

Battersea—40, Este-road, 57 years, ground-rent 2*l*.... 295

By C. C. & T. MOORE.

Mile End-road—Nos. 55 and 57, term 284 years, no ground-rent 1,950
45, Duckett-street, freehold 300
Sydenham—Ground-rent of 30*l*., reversion in 83 years 650
Old Kent-road—Ground-rent of 15*l*., reversion in 64 years 360
Islington—8 and 9, Vincent-terrace, 40 years, ground-rent 12*l*. 1,030
Ratcliffe—43, Caroline-street, freehold 265

By NEWBON & HARDING.

Holloway—1, Isledon-road, 58 years, ground-rent 6*l*. 10*s*. 450
Canonbury—5, Canonbury-grove, 32 years, ground-rent 7*l*. 350
Barnes—1 and 2, Eleanor-cottages, freehold 465
Kilburn—20, Princess-road, 76 years, ground-rent, 6*l*. 240
Caledonian-road—26, Charlesworth-street, 65 years, ground-rent 5*l*. 10*s*. 245
Clerkenwell—6, Arlington-street, 25 years, ground-rent 6*l*. 6*s*. 260

By H. RUTLEY.

Kentish Town—65, Hartland-road, 50 years, ground-rent 5*l*. 345
81, Warden-road, 74 years, ground-rent 7*l*. 315
85, Weedington-road, 73 years, ground-rent 6*l*. 6*s*. 280
Hampstead-road—3 and 4, Exmouth-street, 24 years, ground-rent 23*l*. 10*s*. 420
Barnsbury—2, Stonefield-street, 18 years, ground-rent 5*l*. 305

By H. J. BLISS & SON.

Bethnal Green—7 to 13 odd, Turin-street, 85 years, ground-rent 14*l*. £1,135
1, 3, and 5, Thorold-street, 85 years, ground-rent 10*l*. 10*s*. 795
26 and 28, Thorold-street, 85 years, ground-rent 6*l*. 16*s*. 550
Bethnal Green-road—No. 488, freehold 1,495

By E. STIMSON.

Brixton—43 and 45, Hackford-road, 14 years, ground-rent 8*l*. 15*s*. 325
Upper Kennington-lane—191 and 193, term 20 years, ground-rent 20*l*. 320
Wandsworth-road—No. 299, term 21 years, ground-rent 7*l*. 240
Bermondsey—Ground-rent of 12*l*., reversion in 35 years 255
Southwark Bridge-road—Perpetual rent-charge of 4*l*. 8*s*. 8*d*. 110
Lambeth—Ground-rent of 15*l*. 15*s*., term 23 years... 210
11 to 19, Bond-street, 23 years, ground-rent 28*l*.... 1,615
22 to 30, Doon-street, 23 years, ground-rent 27*l*.... 2,440
Bermondsey—43, New Church-street, 3 years, ground-rent 2*l*. 30

By D. L. GOOCH.

Canning Town—Freehold ground-rents of 85*l*., reversion in 89 years 1,925
Stratford—Ground-rents of 170*l*., reversion in 95 years 3,675
Finsbury Park—Ground-rents of 14*l*., reversion in 76 years 330
Ground-rents of 36*l*., reversion in 76 years 830
Ground-rents of 42*l*., reversion in 85 years 980
Ground-rents of 24*l*., reversion in 76 years 610
Ground-rents of 25*l*. 10*s*., reversion in 76 years ... 625
Ground-rents of 24*l*., reversion in 85 years 622
Ground-rents of 83*l*. 10*s*. 6*d*., reversion in 76 years 2,930

By G. B. SMALLPEICE.

Woking, near—Gothic Villa, freehold 660
Maybury Hill, freehold cottage and grounds 150

MAY 14.

By NORTON, TRIST, WATNEY, & Co.

Hendon—Freehold land, 11a. 3r. 16 p. 1,500
Freehold meadow land, 9a. 3r. 28p. 800
Croydon, Woodside-road—Two plots of freehold land 80

By BAKER & SONS.

Newmarket, near—The Rectory House and 4 acres, freehold 520
New Southgate—7, 8, 11, and 12, St. John's Villas, freehold 705
Kilburn—5, Victoria Villas, 79 years, ground-rent 10*l*. 360
Maida-vale—14, Elgin-mews North, 73 years, ground-rent 5*l*. 120
Kentish Town-road—Nos. 150 and 154, term 29 years, ground-rent 100*l*. 1,190

By C. P. WHITBLEY.

Old Kent-road—Nos. 321 and 323, East-street, 10 years, ground-rent 30*l*. 355
Islington—2 and 4, Cross-street, 25 years, ground-rent 28*l*. 430
Dover's-green, Herts—Clayton's brickfields, 3a. 0r. 33p., freehold 500

By T. B. WESTACOTT.

Kentish Town—46 and 48, Malden-road, 54 years, ground-rent 16*l*. 1,225
31, 33, and 37, Rhyl-street, 54 years, ground-rent 15*l*. 15*s*. 950
45 and 47, Weedington-road, 54 years, ground-rent 16*l*. 1,105
158 and 164, Weedington-road, 70 years, ground-rent 12*l*. 930
64, Dale-road, 78 years, ground-rent 7*l*. 390

By Messrs. TAPLIN.

St. John's Wood—3 and 4, Henstridge-villas, 48 years, ground-rent 21*l*. 4*s*. 805
Hayes, High-road—A plot of freehold land 400
Westminster—29 and 31, Chapter-street, 16½ years, ground-rent 11*l*. 305
Vauxhall Bridge-road—Nos. 73 and 75, term 16½ years, ground-rent 14*l*. 630

MEETINGS.

SATURDAY, MAY 22.

Architectural Association.—Visit to the National Agricultural Hall, Kensington. 3 p.m.

Society of Arts (Special Lecture).—Professor George Forbes, M.A., on "Electricity."—VI. 3 p.m.

TUESDAY, MAY 25.

The Institution of Civil Engineers.—Annual General Meeting to consider the Report, and to elect a President and Council. 8 p.m.

WEDNESDAY, MAY 26.

British Museum (Archaic Room).—Miss J. E. Harrison on "The Topography and Monuments of Modern Athens."—III. 11·45 a.m.

THURSDAY, MAY 27.

Society of Antiquaries.—Ballot for Election of Fellows. 8·30 p.m.

Society of Telegraph-Engineers and Electricians.—Papers by Captain P. Cardew, R.E., and Captain H. R. Sankey, R.E. 8 p.m.

FRIDAY, MAY 28.

University College.—Professor C. T. Newton, C.B., on "Greek Myths illustrated by Fictile Vases and other Monuments."—I. 4 p.m.

British Museum (Archaic Room).—Miss J. E. Harrison on "The Technique of Greek Vases."—III. 11·45 a.m.

The Brick-making Industry of the Metropolis.—The Works and General Purposes Committee of the Metropolitan Board of Works have recommended to the Board that the Society of Medical Officers of Health be informed, in reply to their letter urging that legislation is needed to control the brick-making industry in the metropolis, that the Board, having given careful consideration to the question, are not prepared to take any action in the direction indicated.

Miscellanea.

The Proposed New Bridge at Battersea.—At the meeting of the Metropolitan Board of Works, on the 14th inst., the Clerk read a letter from Mr. Geo. B. Godfrey, whose tender for the erection of a cast-iron bridge across the Thames at Battersea for the sum of 130,000*l*. was provisionally accepted at a previous meeting of the Board, stating that since his tender was before the Board he had gone more minutely into the details, and, for certain reasons which he had stated to the Board's Engineer, he found that he should require 138,000*l*., instead of 130,000*l*., for the execution of the work, and that he should not feel justified in undertaking the contract unless the amount was raised to that sum. On the motion of Mr. Shepherd the subject of these tenders was referred to the Works and General Purposes Committee. The list of tenders for the work was given by us last week (p. 731).——At the meeting of the Board to be held this Friday, the 21st, the Works Committee will present a report recommending that Mr. Godfrey be informed that the Board are not prepared to entertain his suggestion for an increase in the amount of his tender; and also recommending that the next lowest tender, namely, that of Messrs. Williams, Son, & Wallington, amounting to 143,000*l*., be accepted, subject to the same conditions as were attached to the acceptance of Mr. Godfrey's tender.

The Planning of Cow-houses.—Mr. P. McConnell, in his "Dairy Lectures," now appearing in the *Agricultural Gazette*, writes, with reference to the planning of cow-houses:—"The arrangement of the buildings is a point of the most vital importance, seeing that on this depends much of the success of the daily management. It is advisable to have the cow-houses ranging north and south, with the barns, mixing-houses, food-stores, &c., across the northern end, while the dairy should be separate from the cow-house and as far away from sources of smell or taint as possible,—a northern exposure being the best. The system of 'concentration' is the best, whereby the buildings are all contiguous and open into one another. This saves space, cost of erection, and labour of attending to stock. On the dimensions and arrangement of the stalls depend much of the comfort and cleanliness of the animals. The manger should be on the level of the ground, so that the animal could lie down without requiring to back into the gutter behind. The bed should be of the exact length to suit the cow, so that she may stand and lie in the same place. The gutter or channel behind for the droppings should be at least 2 ft. wide, and 8 in. deep at the side next the cow. The passages may be lower than the beds, so that the gutter need not be so deep at this side, but the bottom should have an incline away from the cows. Cows standing in a stall fitted up in this style, and with this wide and deep gutter behind, will always be clean,—a state of matters we seldom see in cow-houses constructed in any other way. A wide dunging-passage must be provided, but it is a matter of taste whether there be a feeding-passage in front or not. If there is, the stall-fronts must be so arranged as to prevent the cows from sticking their heads through."

The Jumna Viaduct.—In connexion with the Cawnpore and Kalpi line, a new branch of the Indian Midland Railway, of which we spoke in the columns of the *Builder* of the 8th inst., there is a very important bridge now in course of construction over the Jumna River. According to the designs, the bridge will consist of girders covering ten spans of 250 ft. each. The piers are 76 ft. high from the level of the water to the lower flange of the main girders, and are to be constructed on well foundations, each pier having two wells, 27 ft. external diameter, and sunk to a depth of 90 ft. below the bed of the river. Up to the present time the work has been almost solely confined to sinking the wells. Some difficulty was experienced in the sinking of one of the pier foundations on account of a well having got 8 ft. out of plumb in going down 50 ft. A steady pull of two to three hundred tons, however, was brought to bear on the upper section of the well, and under the continued strain thus applied the cylinder has been gradually brought back to its proper position as the sinking progressed. The bridge is expected to be open for traffic in about two years. The entire cost, including the approaches, is estimated at thirty-four lakhs of rupees, or 340,000*l*. sterling.

Sales of Building Land at Fulham and Surbiton.—Last week Messrs. Baker & Son submitted to competition, at the Red Lion Hotel, Walham-green, thirty freehold plots on the Bishop's-road and Salisbury estates, fronting on Bishop's-road and Munster-road, Fulham. The sites were described as well adapted for shops and medium-sized houses. The several plots offered have frontages of 17 ft., with a depth of from 60 ft. to 70 ft. Of the entire number of plots submitted, twelve were sold at prices ranging from 75*l.* to 80*l.* each, a corner shop front having a frontage of 23 ft. to Munster-road, with a return frontage of 58 ft. to Bishop's-road, realising 100*l.* Messrs. Baker & Sons also offered for sale seven plots on another portion of the estate, adjoining Messrs. Gibbs & Flew's steam joinery works, six of the plots having frontages of 20 ft. to Bishop's-road by a depth of from 55 ft. to 70 ft. to Rostrevor-road; and an angular plot, having a frontage of 78 ft. to Bishop's-road by an average depth of about 50 ft. The whole of these plots were sold at prices ranging from 46*l.* to 65*l.* each. The total proceeds of the two sales amounted to 1,307*l.* On Tuesday, Messrs. Debenham, Tewson, & Co. offered for sale, at the Auction Mart, fifty-four plots of freehold building land, on the Southborough Park Estate, situate at Surbiton Hill, Surrey, described as being in a first-class residential neighbourhood, and well adapted for the erection of detached or semi-detached residences, and also including sites for shops. The several sites have frontages of from 60 ft. to 70 ft. each, with depths ranging from 200 ft. to 320 ft., and contain areas varying from about half an acre to an acre each. The first four plots offered, having frontages of 70 ft. to Ditton-road, and a depth of 320 ft., were all sold to one purchaser for 290*l.* each, being at the rate of about 600*l.* an acre. For several of the plots next offered from 240*l.* to 260*l.* were offered, at which they were withdrawn. A plot having a frontage of 60 ft. to Lovelace-road and a depth of 210 ft., and containing an area of about a quarter of an acre, was sold for 230*l.*, and another plot having a frontage to the same road of 65 ft. was sold for 245*l.* A corner plot with a long return frontage to Lovelace-road, and containing an area of nearly half an acre, realised 335*l.*; and two plots having frontages of 51 ft. to Lovelace-road, were sold for 245*l.* each. The total proceeds of the sale amounted to 2,460*l.*

Tidal Works on the Seine.—At the meeting on the 5th inst. of the Liverpool Engineering Society Mr. Coard S. Pain, Assoc. Inst.C.E., President, in the chair, a paper by Mr. J. N. Shoolbred, B.A., M.Inst.C.E., entitled "Tidal Works on the Seine, and on other Rivers," was read by the author, who showed that the river Seine is affected by the flow of the tide for about ninety-three miles above Havre, of which the upper fifty-two call for no remark; for the next twenty-five miles down the channel has been confined, where required, within a narrow width, and its navigable bed considerably improved by means of H.W. training walls of rubble stone. The result has been to reclaim 20,000 acres of slob lands behind these walls, which formerly formed part of the bed of the river. These works were begun in 1845 and ended in 1867. The estuary, sixteen miles long, forms the lowest portion of the tidal compartment. Soon after the completion of the river-walls accumulations of sea-borne sand from the coast of Calvados began to be felt in the north-eastern part of the estuary in consequence of the river being no longer available. These accumulations have been gradually extending seawards till their area amounts to about 40,000 acres. The tidal capacity of the estuary has been diminished by one-third. The entrance of the port of Havre is now very seriously threatened, the yearly accretions in its vicinity having amounted for some time past to about eight millions of cube yards. So that the earlier improvement in the navigation of the river Seine threatens to be more than counterbalanced by the deterioration of its estuary.

Polstead, Suffolk.—At a vestry meeting recently held here, it was decided to commence works of restoration to the parish church of St. Mary, Polstead. The church, which is a large one, is one of the oldest Norman churches in the county, and was one of those damaged by the earthquake some two or three years back. The work, which has been placed in the hands of Mr. J. Treadway Hanson, will be commenced at once.

Colonial and Indian Exhibition.—The Reception Committee, recently formed by direction of His Royal Highness the Prince of Wales, Executive President of the Royal Commission, is desirous of offering a fitting and cordial reception to Colonial and Indian visitors of distinction during their visit to England, by facilitating, so far as may be possible, their arrangements for visiting places of special interest in the United Kingdom. To enable the Committee to do this, funds are required; and those who may be desirous of co-operating are invited to subscribe to the object in view. Subscriptions can be sent to the London and Westminster Bank, West End Branch, St. James's-square, S.W.; or to Mr. Arthur Hodgson, C.M.G., General Secretary, at the office of the Reception Committee, "Old London," Exhibition Buildings, South Kensington; or to Mr. H. Trueman Wood, the treasurer, Society of Arts, John-street, Adelphi. Cheques should be crossed "London and Westminster Bank," West End Branch.

Ealing Public Baths.—On Saturday the opening of the new swimming-baths at Ealing took place, Mr. E. M. Nelson, J.P., the chairman of the Board, presiding on the occasion. The baths, which are three in number, are situate on the main Uxbridge-road, and nearly in the centre of the district. They consist of a first-class bath, 90 ft. by 30 ft.; third-class, 75 ft. by 25 ft.; and a ladies' bath, 60 ft. by 24 ft., the latter with a waiting-room overlooking the bath. There is also a club-room, where members of the various clubs in the neighbourhood may hold their meetings. The interior walls of the baths are in plain brickwork relieved with red brick arches. The baths themselves are lined with "Ingham's" white-glazed bricks, a special-made brick 1½ in. thick, being used for the bottom. The woodwork of the interior is stained and varnished; the doors of the boxes are only 3 ft. 6 in. high, the upper part being fitted with curtains. The first-class bath has a gallery capable of holding 500 persons. The heating is by steam injected from two 20-h.p. boilers, and the laundry (for baths only) is contiguous to the boiler-house, the whole of the machinery being worked by a small engine connected with the boilers. The whole of the works have been carried out from the designs and under the superintendence of Mr. Charles Jones, C.E., the engineer to the Board, the contractor being Mr. W. H. Waters, of Ealing; and the machinery, which is of the latest description, was all fitted up by Messrs. Bradford. The contract for the baths, including the machinery, was 8,000*l.*

Artists' General Benevolent Institution.—The seventy-first anniversary dinner of this Institution was held on Saturday last at the Freemasons' Tavern, Great Queen-street, under the presidency of Lord Esher, supported by Sir Frederick Leighton, P.R.A.; Sir J. Gilbert, R.A.; Sir J. D. Linton; Mr. Alma Tadema, R.A.; Mr. W. P. Frith, R.A.; Mr. H. Armstead, R.A.; Mr. H. S. Marks, R.A.; Mr. J. Pettie, R.A.; Mr. A. Waterhouse, R.A.; Mr. J. O. Barlow, R.A.; Mr. E. Burne Jones, A.R.A.; Mr. J. E. Burgess, A.R.A.; Mr. Phil. Morris, A.R.A.; Sir J. E. Millais, R.A. (hon. sec.); Mr. P. C. Hardwick (treasurer), and Mr. D. H. Gordon (secretary). During the evening subscriptions and donations amounting to 2,538*l.* were announced.

An Old Altar-piece in Selborne Church. The *Field*, in an interesting article entitled "A Pilgrimage to White's Selborne," says:—

"Our first visit, as becomes good pilgrims, is to the grave of Gilbert White. . . . . Being Easter-eve, the church was dressed with spring flowers, again simple enough, and in good taste. The good taste, however, fell short in the condition in which we found our next attraction, which was in a little cupboard-like vestry, the really good picture given to this church nearly a century ago by Gilbert's brother Benjamin, for an altar-piece. Painted in three panels, it represents the offerings of the wise men to the infant Christ, and is said to have been painted by Albert Dürer. This was with questionable taste left standing on a newly-washed floor, its only support being the whitewashed wall behind. In front was the one vestry-chair, requiring but a touch to add to the already too numerous chips and peelings off of the picture, which, as may be seen through the spaces so caused, is painted on panels of oak. In these days of art enlightenment, it seems a line is drawn by ecclesiastical authorities between 'artistic altar-cloths,' which may be 'selected' in the neighbourhood of Covent-garden from a 'numerous stock,' and fine old pictures of a bygone school, to the exclusion of the latter from the adornment of our village churches. Surely this picture deserves the loving care bestowed on it by its long passed-away owners, and to be placed in security from further destruction by insidious damp or more careless injury, through the hurried preparations of those who may have to use the same six-foot square vestry. If no better place can be found, the picture might be thought good enough for the very pretty and well-arranged little museum at Alton."

A New Park for Sheffield.—The Corporation of Sheffield has just acquired the beautiful piece of woodland lying on the south of the town known as the Endcliffe Wood. It is intended to lay this place out for the use of the public, and as it is within a mile of the centre of the town, and easily accessible, it will be a boon to the townsfolk, Sheffield not being too well off in the matter of public parks and gardens. The Endcliffe Wood occupies the slope and valley near the Botanical Gardens, and is nearly a mile in length. The slope is covered with large trees, chiefly oaks, and the river Porter runs along the valley, and in its course works three old water-wheels used for grinding, one of which will be retained as a picturesque object; in fact, it is intended to preserve the rusticity of the place as much as possible. Broad walks will traverse the wood, and rustic bridges will span the stream at various points, while along the boundary will be a carriage and footway, 75 ft. wide, planted with trees on each side. The dams which have worked the wheels will be converted into lakes for bathing, skating, and waterfowl; and the outfalls and races will be transformed into waterfalls, there being a fall of some 80 ft. or 90 ft. in the course of the stream between one end and the other. The natural beauty of the woodlands is such that, when embellished a little, few towns will be able to boast of such a delightful public park as Sheffield. The work of laying out the place has been entrusted to Mr. William Goldring, of London.—*Gardeners' Chronicle.*

Cowley St. John, Oxford.—The church of St. Mary and St. John has been further enriched by the opening of a new organ which has been given by Mr. G. Herbert Morrell, of Headington Hill Hall, the cost being defrayed out of a second 1,000*l.* he has generously given towards the completion of the church. The oak case with its elaborate tracery work was designed by the architect of the church, Mr. Mardon Mowbray, F.R.I.B.A., of Oxford and Eastbourne, and executed by Mr. Thompson, of Peterborough, at the cost of over 200*l.*, while the organ itself was built by Mr. Martin, of Oxford, for 450*l.*, provision being made for the addition of a choir-organ later on.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	5	0	7	0	0
Teak, E.I. ....load	12	10	0	15	0	0
Sequoia, U.S.....foot cube	0	2	4	0	2	8
Ash, Canada ....load	3	0	0	4	10	0
Birch ,, ...	3	0	0	4	10	0
Elm ,, ...	3	10	0	4	15	0
Fir, Dantsic, &c.	1	10	0	4	0	0
Oak ,, ...	3	0	0	5	0	0
Canada	5	10	0	6	10	0
Pine, Canada red	3	0	0	4	0	0
,, yellow	3	0	0	5	0	0
Lath, Dantsic .....fathom	3	10	0	5	0	0
St. Petersburg	4	0	0	6	0	0
Wainscot, Riga.....log	2	15	0	4	10	0
,, Odessa, crown	3	12	6	3	15	0
Deals, Finland, 2nd and 1st...std. 100	7	10	0	8	10	0
,, 4th and 3rd	6	0	0	7	10	0
Riga	6	0	0	8	0	0
St. Petersburg, 1st yellow	9	0	0	14	0	0
,, 2nd ,, ...	7	0	0	8	15	0
,, white	7	0	0	10	0	0
Swedish....	6	0	0	15	0	0
White Sea	7	0	0	17	10	0
Canada, Pine 1st	17	0	0	30	0	0
,, 2nd	12	0	0	17	0	0
,, 3rd, &c.	6	0	0	10	0	0
,, Spruce 1st	8	0	0	11	0	0
,, 3rd and 2nd	5	0	0	7	10	0
New Brunswick, &c....	5	0	0	7	0	0
Battens, all kinds	4	0	0	12	0	0
Flooring Boards, sq. 1 in.—Prepared, first	0	9	0	0	13	0
Second	0	7	6	0	8	6
Other qualities	0	5	0	0	7	0
Cedar, Cuba.....foot	0	0	3½	0	0	4
Honduras, &c.	0	0	3	0	0	4
Australian	0	0	2½	0	0	3
Mahogany, Cuba	0	0	5	0	0	7½
St. Domingo, cargo average	0	0	5	0	0	7½
Mexican ,, ...	0	0	3½	0	0	4½
Tobasco ,, ...	0	0	4	0	0	6½
Honduras ,, ...	0	0	4½	0	0	6½
Maple, Bird's-eye....	0	0	6	0	0	8
Rose, Rio .....ton	7	0	0	10	0	0
Bahia....	6	0	0	10	0	0
Box, Turkey	5	0	0	18	0	0
Satin, St. Domingo .....foot	0	0	7	0	0	11
Porto Rico	0	0	8	0	1	3
Walnut, Italian	0	0	4	0	0	5
METALS.						
IRON—Pig in Scotland .....ton	0	0	0	0	0	0
Bar, Welsh, in London....	4	10	0	4	17	6
,, ,, in Wales	4	5	0	4	10	0
,, Staffordshire, London	5	5	0	6	10	0
Sheets, single, in London....	6	15	0	8	10	0
Hoops ,, ...	6	0	0	7	0	0
Nail-rods ,, ...	5	10	0	6	10	0
COPPER—						
British, cake and ingot .....ton	43	0	0	44	0	0
Best selected	45	0	0	46	0	0
Sheets, strong....	50	0	0	0	0	0
,, India	47	0	0	48	0	0
Australian	47	0	0	47	10	0
Chili, bars	40	0	0	41	0	0

METALS (*continued*).	£.	s.	d.	£.	s.	d.
YELLOW METAL.....lb.	0	0	4½	0	0	4½
LEAD—Pig, Spanish	12	17	6	0	0	0
English, common brands.....	13	7	6	0	0	0
Sheet, English	14	0	0	14	5	0
SPELTER—						
Silesian, special .....ton	14	5	0	0	0	0
Ordinary brands	14	0	0	14	2	6
TIN—						
Banca .....ton	0	0	0	0	0	0
Billiton	0	0	0	0	0	0
Straits	96	10	0	0	0	0
Australian	96	15	0	0	0	0
English ingots.....	101	0	0	0	0	0
ZINC—						
English sheet .....ton	18	0	0	18	5	0

OILS.	£.	s.	d.	£.	s.	d.
Linseed .....ton	19	17	6	20	5	0
Cocoanut, Cochin	28	10	0	29	0	0
Ceylon	24	15	0	0	0	0
Copra.....	0	0	0	0	0	0
Palm, Lagos	22	0	0	23	0	0
Palm-nut Kernel	0	0	0	0	0	0
Rapeseed, English pale.....	22	15	0	0	0	0
,, brown	21	5	0	20	0	0
Cottonseed, refined	17	0	0	17	15	0
Tallow and Oleine	25	0	0	45	0	0
Lubricating, U.S.	6	0	0	10	0	0
,, Refined	8	0	0	13	0	0
TURPENTINE—						
American, in casks.....cwt.	1	5	6	0	0	0
TAR—Stockholm .....barrel	0	17	0	0	17	6
Archangel.....	0	10	6	0	11	3

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page.
Fleming Memorial Hosptl. Newcastle-on-Tyne	The Committee.....	50*l.*, 30*l.*. and 20*l.*...	Not stated	i.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Tar Paving Works.....	Willesden Local Board	O. Claude Robson	May 25th	ii.
Iron Pipe Laying	Tottenham Local Board	— De Pape	do.	ii.
New Albion Club, Ramsgate	.....	.....	do.	ii.
New Buildings for Cathedral School, Worcestr	.....	Ewan Christian.....	May 26th	ii.
Infant School and Boundary Walls	S. Shoebury Schl. Brd.	W. J. Wood	May 29th	xiii.
Painting and Cleansing Works to Hospital ...	Met. Asylums Board ...	*Official*	May 31st	ii.
Sewage Extension Works	Tottenham Local Board	— De Pape	do.	ii.
Repairing Roads.....	Cheshunt Local Board	T. Bennett.....	June 1st	ii.
Sewage Tanks, &c.....	Devizes U.S.A.....	J. H. Kidd.....	do.	ii.
Infectious Diseases Hospital.....	Widnes Local Board ...	— Higginson.....	do.	ii.
Painting, &c., Gosport.....	War Department.....	*Official*	do.	i.
Lime-whiting, Painting, &c., Portsmouth	do.	do.	do.	i.
Footbridge, &c., to Station at Mutley	Great Western Ry. Co.	do.	do.	ii.
New Passenger Station, Mells	do.	do.	do.	ii.
Granite Curb	Worthing Local Board	do.	do.	xiii.
Painting, Whitewashing, &c.....	St. George's Union	H. Saxon Snell	do.	xiii.
New Board and Relief Offices, &c.	West Bromwich Union	W. Henman	June 2nd	ii.
Erection of ten small Houses, High Barnet ...	.....	W. & F. Houghton.....	do.	ii.
Mansions, &c., near Cannes (South of France)	Cannes Extension Co....	T. Mullett Ellis	do.	xiii.
Drainage of Cemetery	St. Mary, Islington, Burial Board	*Official*	June 7th	ii.
Sewerage Works	St. Luke's Vestry	do.	June 9th	ii.
Erection of School.....	Wanstead School Board	Bressey & Liddon Walters	June 10th	ii.
Storage Reservoir, &c.....	Bristol Waterworks Co.	J. Taylor & Sons	June 11th	ii.
Restoration of Wing of Mansion, nr. Salisbury	Right Hon. Earl Nelson	H. Hall	Not stated	ii.
Steam Flour-Mill, Wellingborough.....	J. B. Whitworth	Usher & Anthony.....	do.	ii.
Erection of Factory, Crewkerne	.....	H. Hall	do.	ii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Clerk of Works	Civil Service Com.	Not stated	June 5th	xviii.
Clerk of Works	Uxbridge R. S. A.....	do.	Not stated	xviii.

TENDERS.

BERMONDSEY.—For alterations and fittings at the Leather Exchange Tavern, Weston-street, for Mr. W. W. Thorn. Mr. E. Crosse, architect, Bermondsey-square. No quantities :—

A. White & Co.	£349 0 0
F. Higgs.....	348 0 0
Spencer & Co. (accepted).....	330 0 0

BOURNEMOUTH.—For making roads, &c., Canford Cliff's Estate, West Bournemouth, for the Proprietors. Messrs. Kemp, Welch, & Pinder, surveyors, Bournemouth :—

	Roads.	Catch-pits each.
W. Neave & Son, Paddington	£1,906 0 0 ...	£3 0 0
J. Kingswell, Calbourne, Isle of Wight.....	1,741 0 0 ...	2 0 0
T. Small & Sons, Wandsworth	1,449 0 0 ...	2 16 0
Beadle Bros., Erith, Kent.....	1,248 0 0 ...	5 17 6
S. Minty, Bournemouth.....	1,070 3 0 ...	5 0 0
T. B. Hayter, Landport.....	1,033 0 8 ...	1 14 0
Candy & Lock, Bournemouth	935 16 4 ...	2 5 0
Saunders & White, Bournemouth	829 7 3 ...	4 0 0
G. Troke, Winton, Bournemouth (accepted).....	708 7 9 ...	2 11 6

[Surveyor's estimate, roads £679 3s. 6d., catch-pits £3 each.]

COLCHESTER.—For the erection of stabling, &c., for the Colchester and East Essex Co-operative Society. Plans by the Committee :—

Ambrose.....	£410 15 0
T. J. Ward.....	405 0 0
G. Lee.....	397 10 0
F. Dupont	395 0 0
A. Chambers.....	395 0 0
C. H. Oldridge (accepted)	384 0 0

[All of Colchester.]

COLCHESTER.—For the erection of new stables, &c., for Mr. A. Prior. Mr. James F. Goodey, architect :—

F. Dupont.....	£393 0 0
G. Dobson.....	389 0 0
E. Eade	387 0 0
Everett & Son	385 0 0
Oldridge	380 0 0
Chambers	375 0 0
T. J. Ward	366 0 0
G. Lee.....	364 0 0
A. Diss (accepted)	350 0 0

[All of Colchester.]

COLCHESTER.—For the erection of shops, &c., St. Nicholas-street, for Messrs. F. W. Warmington & Co. Mr. James F. Goodey, architect, Colchester :—

E. Eade	£1,400 0 0
W. Shead & Son	1,370 0 0
A. Diss.....	1,350 0 0
C. H. Oldridge.....	1,300 0 0
F. Dupont	1,249 0 0
G. Dobson	1,188 0 0
Everett & Son	1,174 0 0
A. Chambers.....	1,136 0 0
G. Lee (accepted).....	1,095 0 0

[All of Colchester.]

GREAT MARLOW.—For proposed alterations and additions to house and shop, High-street, Great Marlow, for Mr. Clark. Mr. Walter Batting, architect, Salisbury-street. Messrs. Theobald & Luetchford, surveyors, Finsbury-pavement :—

Walker (accepted)	£170 0 0

HAMMERSMITH. — For alterations at the Swan Tavern, Hammersmith :—

Gasfitters' Work.

Buckley & Beach.....	£152 12 6
W. Winn (accepted)	128 0 0

Pewterer's Work.

J. Warne	120 0 0
Buckley & Beach.....	110 0 0
Saunders (accepted)	101 0 0

HATFIELD (Herts).—For new chancel, organ-chamber, and vestry to the church of St. Mary, at Hatfield, Herts. Mr. H. Hardwicke Langston, architect, 9, Great James-street, Bedford-row, London. Quantities supplied :—

First Contract.—Foundations, &c.

		Allowance for old materials.
Harris & Wardrop, London.....	£318	£10
Nightingale, London	310	15
Ekins & Son, Hertford	300	25
Falkner, London (accepted).....	275	30

HENDON.—For the erection of a pair of semi-detached villa residences at Finchley-lane, Hendon, for Mr. C. Cooper. Mr. G. H. Luetchford, architect, Hendon. Quantities supplied by Messrs. Theobald & Luetchford, surveyors, Finsbury-pavement :—

J. Roberts.....	£1,100 0 0
C. Groves	1,065 0 0

HIGHGATE.—For alterations and additions to Northfield Hall, Highgate, for the Trustees. Quantities by Messrs. Evans & Deacon, 1, Adelaide-street, Charing-cross :—

J. Kerry & Hollidge, Highgate	£2,120 0 0
Southcott & Co., Highgate.....	2,059 0 0
E. Kerry & Son, Highgate.....	1,777 0 0
W. Tongue, Plumstead (accepted)...	1,631 0 0

HIGHGATE.—For the erection of house and shop in the Archway-road, on the Highgate Archway Estate. Mr. Frederick W. Fryer, architect, Beckenham :—

Moss	£610 0 0
Porter (accepted)	593 0 0

[Architect's estimate, £600.]

HOLLOWAY.—For alterations, additions, and repairs to the Postal Telegraph Factory, Bovay-place, Holloway, for the Commissioners of Her Majesty's Works and Public Buildings. Mr. Henry Tanner, architect :—

Pack Bros., Brixton (accepted)	£2,500 0 0

KILBURN.—For the erection of a steam laundry in Kilburn-lane, N.W. Mr. Ernest Turner, architect :—

Cubitt & Co.	£12,758 0 0
Patman & Fotheringham.....	12,473 0 0
Kirk & Randall	12,389 0 0
Patrick & Son.....	12,316 0 0
Boyce.....	12,250 0 0
Scrivener & Co.	12,175 0 0
Higgs & Hill	11,896 0 0
Peto Bros.	11,747 0 0
Stephens & Bastow	11,477 0 0
Holloway Bros.	11,223 0 0
Johnson.....	11,100 0 0
Richens & Mount	10,462 0 0

KINGSWEAR (Devon).—For two cottages, Kingswear, South Devon. Mr. G. H. Birch, F.S.A., architect :—

Messrs. John & James Short, Kingswear (accepted)	£1,919 0 0*

* Including £229 for boundary wall.

LONDON. — For rebuilding the Hummums Hotel, Covent-garden, for Mr. Harry Smith. Messrs. Wylson & Long, architects, King William-street, Strand :—

G. Trollope & Son	£19,451 0 0
B. E. Nightingale	18,978 0 0
Stephens & Bastow	18,777 0 0
T. L. Green	18,745 0 0
Hall, Bedall, & Co.	17,988 0 0
S. R. Lamble	17,941 0 0
Ashby & Horner.....	17,790 0 0
Dove Bros.	17,775 0 0
W. Shurmur	17,759 0 0
J. T. Chappell.....	17,732 0 0
M. Patrick & Son	17,687 0 0
W. Brass & Son (arrived late)	17,648 0 0
W. Oldrey	17,470 0 0
Patman & Fotheringham (accepted)	17,389 0 0

LONDON.—For the erection of a new building on the site of Nos. 461 and 463, Oxford-street, W. Messrs. T. Chatfeild Clarke & Son, architects. Messrs. Leonard & Clarke, surveyors :—

Clarke & Bracey	£6,620 0 0
Haylock	6,594 0 0
Colls & Sons	6,548 0 0
Patrick & Son	6,494 0 0
Hall, Beddall, & Co.	6,330 0 0
Brown, Son, & Blomfield	6,025 0 0
E. Conder	5,996 0 0
A. Bush	5,947 0 0
B. C. Nightingale.....	5,820 0 0
Bywaters.....	5,753 0 0
Holland & Hannen	5,713 0 0
J. Morter	5,640 0 0
C. Lawrance & Sons (accepted)	5,459 0 0

LONDON.—For stonework at new premises in Friday-street, Cheapside, for Mr. D. F. Cooke. Mr. Delissa Joseph, architect, Basinghall-street :—

J. W. Seale & Son	£384 0 0
Hindle & Moorish	347 0 0
G. Herridge (accepted).....	335 0 0

LONDON.—For alterations and decorations to the Ship Tavern, Lincoln's Inn, for Mr. J. Cox. Mr. E. Clark, architect, Strand :—

T. L. Green	£161 0 0
H. Pickersgill	134 0 0

LONDON.—For alterations and additions to No. 39, Rutland-gate, S.W., for Col. Charles Mercier. Mr. Edward Clark, architect, Strand :—

McFarlane Bros.....	£649 0 0
J. O. Richardson	623 0 0
T. L. Green	593 0 0
J. Anley.....	570 0 0
Wilkinson Bros.	560 0 0
Jackson & Todd (accepted)	535 0 0

MELTON (Suffolk).—For new laundry buildings and machinery at the Suffolk County Asylum, Melton. Messrs. John Giles & Gough, architects. Quantities supplied by Mr. Charles H. Goode :—

P. Husman & Co. (accepted).....	£6,840 0 0

Water Tower and Stone Tank.

P. Husman & Co. (accepted)	2,279 0 0

MINSTER (Thanet).—For new school buildings and dining-hall to Minster Workhouse, Thanet. Mr. W. G. Bower, architect, Margate. Quantities by Messrs. Gardiner, Son, & Theobald, Great Russell-street :—

Weston, Westgate-on-Sea	£10,364 0 0
Paramor & Sons, Margate	10,150 0 0
Port, St. Lawerence	10,010 0 0
Brown & Son, Margate.....	9,700 0 0
Home, Ramsgate	9,650 0 0
Webster, Folkestone	9,500 0 0
Shrubsole, Faversham	9,348 0 0
Denne, Deal.....	9,295 0 0
T. & W. Denne, Walmer.....	9,250 0 0
Wise, Deal	8,994 0 0
Frostick, *Westgate-on-Sea.....	8,700 0 0
Martin, Ramsgate	8,385 0 0

* Accepted.

MITCHAM.—For gasworks (exclusive of builder's work) at Mitcham, Surrey, for the Guardians of the Poor of the Holborn Union. Messrs. H. Saxon Snell & Son, architects, London:—

	If Gas-holder Tanks are of Brick.	Iron.
R. Dempster & Sons	£3,679	£4,050
Renshaw, King, & Co.	3,679	3,629
Ashmore, Benson, Pease, & Co.	3,550	4,871
R. & J. Dempster	3,146	4,046
Cutler & Sons	3,117	3,796
Berry & Sons	3,0 0	3,860
May Bros	2,875	3,695
Porter & Co.	2,625	3,515
Holmes & Co. (accepted)	2,490	3,635

NEWCASTLE-ON-TYNE.—For gates, gateways, retaining-wall, and for additional boundary walling at the Newcastle City Asylum Extensions, for the Visiting Justices. Mr. Arthur Plummer, architect:—

Amended Tenders.

W. Scott, Newcastle	£1,700 0 0
Middlemiss Bros., Newcastle*	1,527 0 0

* Accepted.

PEMBROKE.—For the restoration of St. Michael's Church. Mr. E. H. Lingen Barker, architect:—

Stephens & Bastow, Bristol	£1,981 0 0
Davies & Morgan, Pembroke Dock	1,938 0 0
Davies, Tenby	1,789 0 0
Llewellyn, Pembroke Dock	1,462 0 0
Barrett & Phillips,* Pembroke	1,450 0 0
Canton, Pembroke	1,450 0 0
Edwards, Milford Haven	1,335 0 0
Giles, Whitland	1,296 0 0

* Exclusive of tower.

PONDER'S END.—For alterations at the Railway Hotel, Ponder's End, for Mr. Holinbury. Mr. George Richards, architect:—

Mower	£499 0 0
Smith	455 0 0
Sills	358 0 0
Hawkins	349 0 0

POPLAR.—For the erection of new lecture-hall and class-rooms, &c., at the Poplar Wesleyan Chapel, East India-road, E., for the Trustees. Mr. James F. Wesley, architect, Forest-gate:—

J. Curnow	£1,183 0 0
M. A. Palmer & Co.	1,149 0 0
J. H. Johnson	1,125 0 0
Harris & Wardrop (accepted)	1,093 0 0

ROMFORD.—For sewerage works for the Rural Sanitary Authority. Contract No. 2, for low or high level sewers to parts in Ilford, Chadwell, and Dagenham, with outfall works, subsiding tanks, filter beds, and other works in connexion therewith. Messrs. Brundell, Simmonds, & Brundell, engineers:—

B. Cooke & Co., Church-road, Battersea (accepted)	£9,696 0 0

SHEPHERD'S-BUSH.—For rebuilding the Seven Stars Tavern and house and shop adjoining, Goldhawk-road, Shepherd's-bush, for Messrs. Thorne. Messrs. Lee Bros. & Pain, architects, 8, Adelphi-terrace, W.C.:—

Chamberlain Bros.	£9,355 0 0
A. Newcombe	9,230 0 0
Simpson & Son	8,602 0 0
Holloway Bros.	8,524 0 0
L. H. & R. Roberts	8,186 0 0
G. H. & A. Bywaters	8,082 0 0
Lathey Bros.	7,937 0 0

SOUTH SHIELDS.—For the erection of two houses and shops in Ocean-road. Messrs. Southron & Hallam, architects:—

W. Scott, South Shields	£1,323 4 2½
T. Mackey, South Shields	1,298 0 0
T. Elliott, North Shields	1,296 0 0
W. Lax, Crook	1,275 0 0
Reay & Leighton, North Shields	1,252 0 0
T. Fortune, Jarrow	1,249 0 0
J. Littler & Son, Hebburn	1,246 0 0
H. Prior, South Shields	1,170 0 0
D. Lawes & Co., South Shields	1,109 7 1½
G. Green, South Shields	1,106 2 0
E. Anderson, South Shields	1,091 4 2
T. Holliday, South Shields	1,074 8 8
W. Tindle, South Shields	1,064 8 6
J. Nichol & Son, South Shields	1,049 0 0
W. M. Ornsby, South Shields	1,038 0 0
N. Napier, South Shields*	1,025 14 0

* Accepted.

SOUTHWARK.—For warehouse, No. 26, Southwark-street, Borough. Mr. Geo. Lethbridge, architect. Quantities supplied by Mr. Charles H. Goode:—

Clarke & Bracey	£4,356 0 0
Colls & Son	4,259 0 0
Higgs & Hill	4,194 0 0
Patman & Fotheringham	4,035 0 0
Lorre	3,958 0 0
Scott	3,882 0 0
Harris & Wardrop (accepted)	3,797 0 0

TIVERTON.—For 2,376 yards of 24-inch stoneware outfall sewer and laying out 11 acres of filtering ground, in connexion with the Tiverton Drainage Works. Messrs. Gotto & Beesley, engineers, Westminster. Quantities supplied:—

Osenton	£5,909 0 0
J. Dickson	4,910 0 0
Bell	4,898 0 0
Pithall & Son	4,882 0 0
Ambrose & Son	4,785 0 0
Bentley	4,720 0 0
Hilton	4,515 0 0
Sharp	4,314 0 0
Williams	4,251 0 0
Hill & Co.	4,2 0 0
W. Gibson	4,195 0 0
Small & Son	3,983 0 0
Gould & Co.	3,980 0 0
Hawkins	3,879 0 0
Cunliffe	3,770 0 0
Pithall	3,691 0 0
J. Edmondson (accepted)	3,656 0 0

WEM (Salop.)—For alterations to Wem Church, Salop. Mr. George H. Birch, F.S.A., architect, Devereux-chambers, Temple:—

E. George, Shrewsbury	£2,670 0 0
R. Yates, Shifnal	2,569 0 0
O. Jones, Shrewsbury	2,550 0 0
G. Phillips, Wem	2,095 0 0
T. & H. Davis, Wem	1,939 0 0
H. Tommy, Wem (accepted)	1,915 0 0

WIMBLEDON.—For proposed alterations and additions to St. John's Lodge, Raynes Park, Wimbledon, for Messrs. Blount, Lynch, & Petre. Mr. G. H. Luetchford, architect, Hendon. Quantities supplied by Messrs. Theobald & Luetchford, Finsbury-pavement:—

G. Stephenson	£493 0 0
F. Mark	479 0 0
T. Taylor	432 10 0
Russell & Ball	424 18 0

SPECIAL NOTICE.—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, W.C., *not later than Four p.m.* on THURSDAYS.

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DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

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